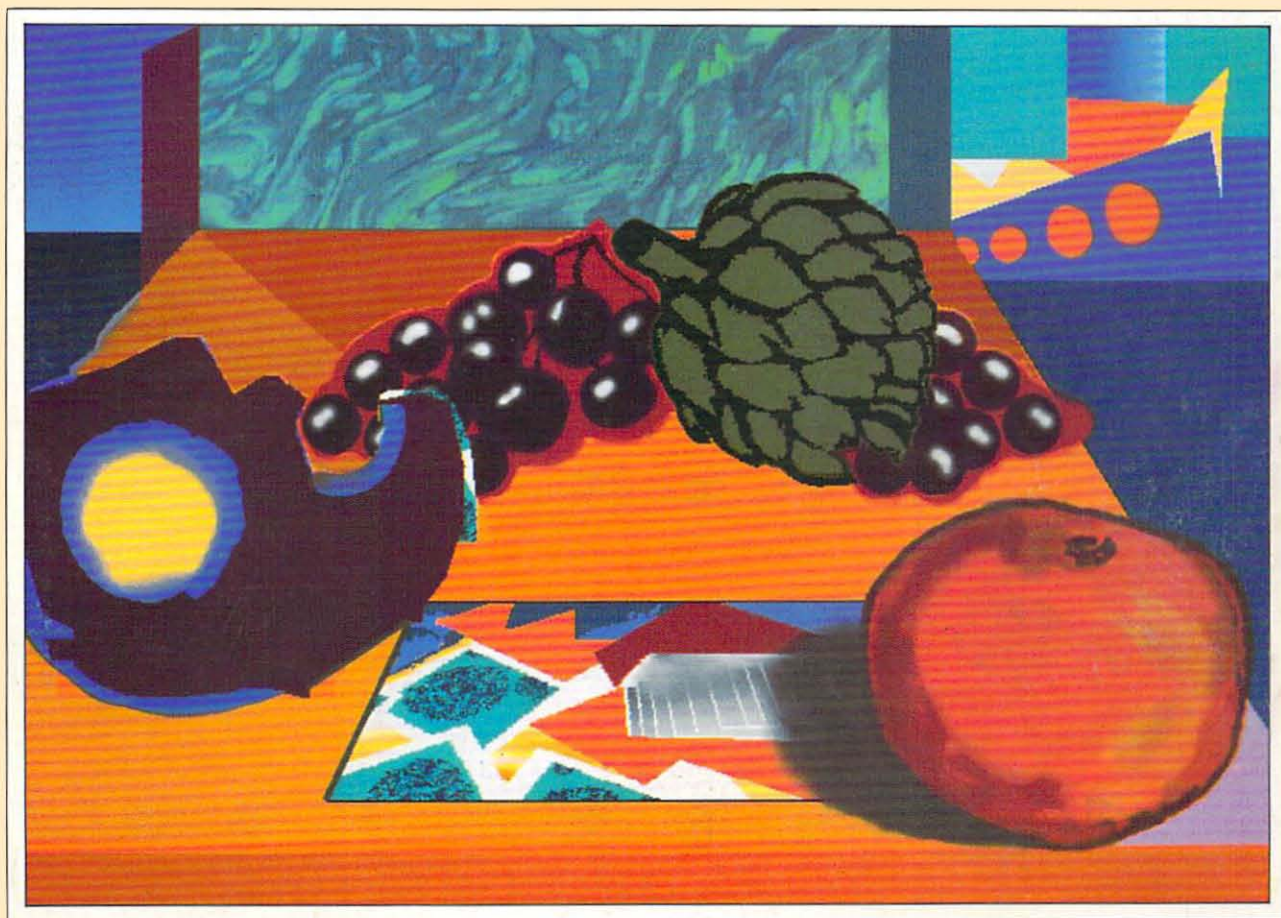


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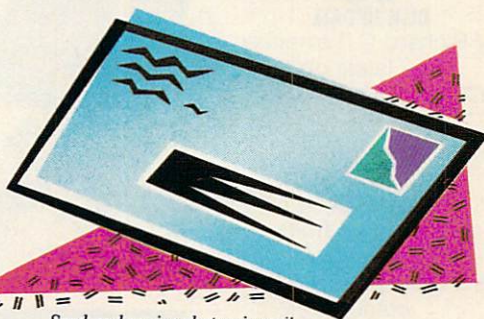


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64/128 VIEW

New 64 titles were scarce at the Consumer Electronics Show, but there's still some fun coming our way.

Tom Netsel

The 1991 International Summer Consumer Electronics Show closed its doors recently in Chicago after 55,629 attendees logged many extra miles on their Nike and Reebok Frequent Hiker plans. It took a lot of shoe leather to visit each of the 1,019 exhibits that filled a half-million square feet of exhibit space, and finding new 64 titles in this electronic mid-way was something of a challenge.

There were plenty of PCs and Amigas displaying new software, but there were no 64s. Many companies say they no longer get enough return on their investment to continue producing products for the 64.

After much asking, probing, and poking around, however, I did manage to locate some new products. ReadySoft says its multidisk *Wrath of the Demon* should be out in September, but look for it on cartridge, too. "With the introduction of the Commodore Game Console in England, cartridge games developed for that system will work just fine on a 64," says ReadySoft Senior Vice President Elizabeth Arnold.

This state-of-the-art game contains more than 3MB of graphics data, 600 screens of action, and 1400 frames of animation. Look for more cartridges and disks coming from the U.K., since ReadySoft has joined Empire Software and will be importing some of its products. Another title due out in late fall is *Guy Spy*.

At Electronic Arts, affiliated labels SSI and Mindcraft have new offerings that

should be exciting. Step up to the plate with Strategic Simulations' *Ultimate Baseball*. That's the working title, but whatever it's called, this simulation lets you play, manage, or watch one game or a whole 162-game season.

War game fans haven't been forgotten. Look for an SSI war game coming soon. It's called *Medieval Lords*.

Gateway to the Savage Frontier is the first of a new AD & D series from SSI. It takes place in a mysterious territory in the world of Forgotten Realms. Starting in the town of Yarter, venture over a vast wilderness on a quest for four magical statuettes.

Later this year, look for *The Magic Candle, Vol. 2* from Mindcraft. In this sequel explore the dreaded realm of Gurtex in search of the dark secrets of black candles. A new user interface lets you capture conversations, eliminating the need for constant note taking. Astound friend and foe with new spells, such as Glamour, Courage, and Terrify.

The Electronic Zoo is bundling 20 popular games from Great Britain and sending them to the U.S. as *Star Collection*. These hits should be available now.

Konami is another company supporting the 64—and now one of the more active ones. Over the next few months, look for five new games based on popular movies and hit television programs. Look for such exciting titles as *Bart Simpson's Adventure*, *Simpsons' Arcade Game*, *Teenage Mutant Ninja Turtles: The Arcade Game*, *Back to the Future III*, and *Predator 2*. □

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COMMODORE CLIPS

Tom Netsel

GAZETTE GALLERY

Each month *Gazette Disk* features a collection of the best 64/128 artwork submitted by our readers. We pay \$50 for each piece of art we accept for "Gazette Gallery" and an extra \$50 for the one selected as Picture of the Month and featured on this page. To submit your original artistic creations, send them to Gazette Gallery, COMPUTE Publications, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.

Gazette Goes Online

Two of the biggest names in the Commodore world are joining forces to offer 64 and 128 users an exciting new dimension to their computing activities. COMPUTE's Gazette will soon be online at Quantum-Link (8619 Westwood Center Drive, Vienna, Virginia 22180; 800-827-8444).

You've read Gazette for years; soon you can access Gazette electronically on the only Commodore-specific online service. With your comput-

er, modem, and Q-Link's free terminal software, you'll be able to access many of your favorite Gazette features. Check Gazette and Q-Link as details become available about our upcoming debut.

Check This Out

Sparks Electronics (P.O. Box 0475, St. Joseph, Missouri 64504-0475) has released *S.E.C. Check Register 128* (\$16) for the 128 in 80-column mode. Designed to manage personal or small business checking accounts, *S.E.C. Check Register* can contain up to 750 entries.

Special emphasis is given to data entry, recurring payees, check printing, and printing of register data. Recurring payee files can contain up to 54 names and addresses, but users can load others into the current register for an unlimited number of payees.

Earnings Up at Commodore

Commodore International Limited reported \$10.6 million in income on sales of \$246.3 million for the third fiscal quarter of 1991, which ended March 31. This represents a substantial increase in earnings and a 16-percent increase in sales compared to the year-ago quarter. An extraordinary charge of \$9.2 million relating to a previously announced court settlement of litigation was recorded in the quarter, resulting in net income of \$1.4 million.

For the nine months that ended March 31, 1991, income increased tenfold to \$54.1 million compared with \$5.0 million in the prior year. Sales increased 21 percent to \$830.7 million, compared with \$689.2 million in the year-ago period. Net income for the nine months increased ninefold to \$44.9 million, or \$1.37 per share.

Every product line contribut-

ed to revenue growth in the quarter. Unit sales of Amiga computers increased 30 percent, while the 64 product line registered unit growth of 48 percent, largely due to expanded sales in new markets.

The Krynn Epic Continues

Strategic Simulations announces the release of *Death Knights of Krynn* (\$39.95) for the 64. (SSI products are distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, California 94404.) This game is the sequel to the popular *Advanced Dungeons & Dragons* fantasy role-playing game *Champions of Krynn*.

Death Knights of Krynn begins a year after the conclusion of *Champions of Krynn*. At a victory party on the anniversary of the evil force's defeat, the celebration is interrupted by an unwelcome party crasher. The undead Sir Karl sweeps in on a Death Dragon and steals a revered Dragonlance. The adventure begins as the champions set out to track Sir Karl and recover the stolen item.

Your favorite characters from *Champions of Krynn* can be imported to *Death Knights of Krynn*, along with their accumulated items and wealth. This is a new feature not previously offered in AD & D fantasy role-playing games.

Big Al and Pals

Return to Chicago's golden age of gangsters and take on the Mob in *The Untouchables* (\$14.95) from Ocean of America (distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, California 94404).

Guide Eliot Ness's band of mob-busters through five levels of arcade action: the Warehouse Bust, the Border Raid, the Alley Shootouts, the Railway Station Confrontation, and the Rooftop Duels. □

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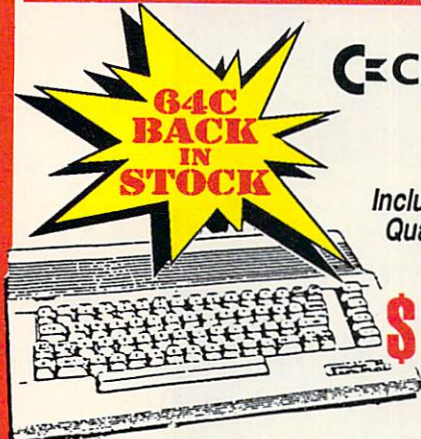
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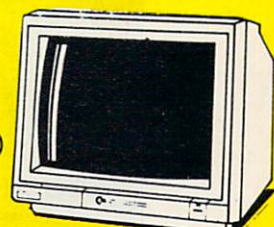
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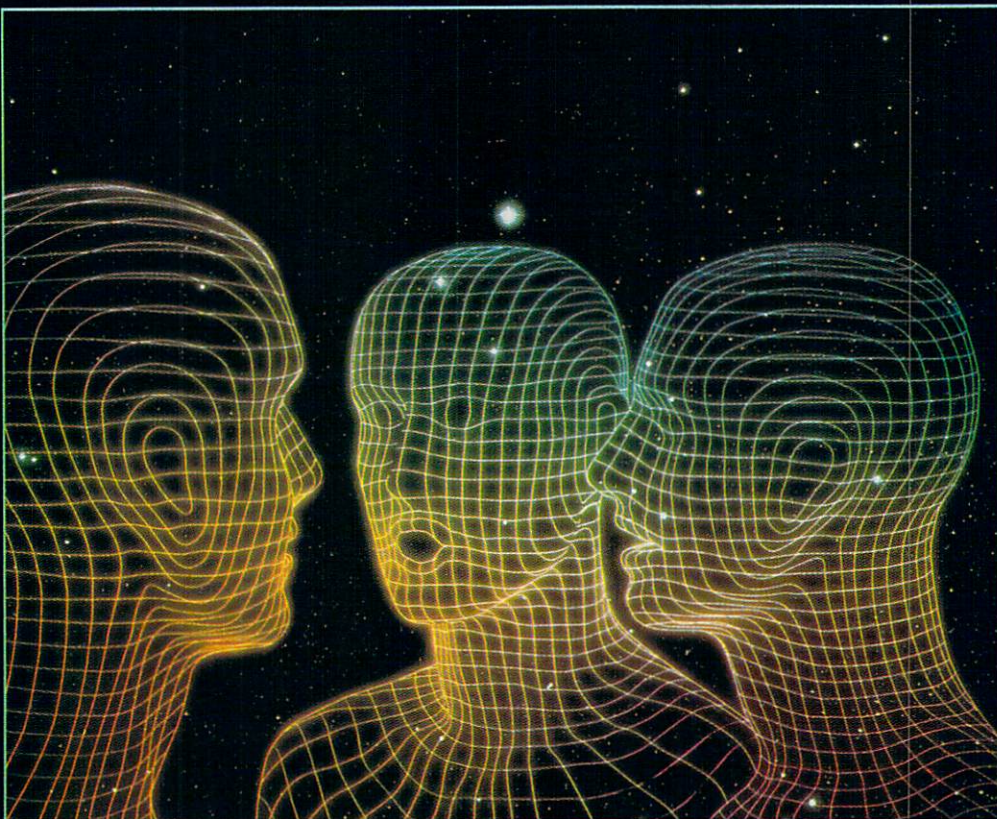
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A GUIDE TO
**COMMODORE
USER GROUPS**
PART TWO

EDITED BY KANDI SYKES
AND DANA STOLL

UNIPHOTO/PICTOR

Here's Part 2 of the list of user groups, concluding with those in New Jersey through Wyoming, APOs, and other countries.

NEW JERSEY

Info 64 Commodore User Group, c/o Jerry Fleischer, 186 Delmar Ave., Glen Rock, NJ 07452

Hillsdale Commodore 64 Users Club, 32 Esplanade Lake Dr., Hillsdale, NJ 07642

Garden State Commodore & MS-DOS User's Group, 89 Stratford Rd., Tinton Falls, NJ 07724 (BBS# 201-938-3885)

Commodore User Group of Central New Jersey, 112 Old Bridge Rd., Matawan, NJ 07747

Morris Area Commodore User Group (MACUG), P.O. Box 492, Mt. Tabor, NJ 07878

Rancocas Valley Users Group (RVUG), c/o G. C. Heath, 806 Windsor Dr., Cinnaminson, NJ 08077 (BBS# 609-267-7945)

Data Exchange-Beneficial Users Group 64/128 (D.E.-B.U.G. 64/128), 713 Second St., Dunellen, NJ 08812

Commodore E. Brunswick Users Group (CEBUG), P.O. Box 314, E. Brunswick, NJ 08816

NEW MEXICO

New Mexico Commodore User Group, P.O. Box 37127, Albuquerque, NM 87176 (BBS# 505-268-4662)

Los Alamos Commodore Users Group, 4214-A Arizona St., Los Alamos, NM 87544 (Voice# 505-662-5934)

Taos Area Commodore User's Group, P.O. Box 5686, Taos, NM 87571

The Southern New Mexico Commodore User's Group, P.O. Box 4437, University Park Branch, Las Cruces, NM 88003

Commodore Users Group of Roswell (CUGOR), 1619 N. Kansas, Roswell, NM 88201

NEW YORK

New York Commodore Interest

Group (NYC=ig), 115 Essex St., Box #146, New York, NY 10002

Kids' Computer News, St. Hilda's & St. Hugh's School, 619 W. 114th St., New York, NY 10025

Folklife Terminal Club, Box 555-R, Co-op City Station, Bronx, NY 10475

Brooklyn Commodore User's Group, c/o Grodman, 1111 Shore Pkwy., Brooklyn, NY 11228 (Voice# 718-331-3835)

Queens Commodore Users Group (QCUG), P.O. Box 129, Ozone Park, NY 11417 (BBS# 718-366-7445)

Commodore Users Group of Greater New York, 190-25 Woodhull Ave., Hollis, NY 11423

N.C.C.C., P.O. Box 233, Sea Cliff, NY 11579

Commodore Long Island Club, 15 Rochelle Ct., Amityville, NY 11701 (BBS# 516-489-4061)

Brentwood 64/128 Computer Club, Public Library, 2nd Ave. & 4th St., Brentwood, NY 11717

Mohawk Valley Computer User Group, c/o William Nowak, 3818 Stinson Ave., Tribes Hill, NY 12177

Tri-City Commodore User's Group (TCCUG), P.O. Box 12742, Albany, NY 12212-2742

Hudson Valley Commodore Club, P.O. Box 2190, Kingston, NY 12401

The Commodore Computer Club of Syracuse, 233 Williams St., Minoa, NY 13116 (BBS# 315-656-3544)

Oswego Commodore User Group, 402 Mahar Hall, State University College, Oswego, NY 13126

Commodore User Group of Massena (COMA), Star Tech, 280 E. Orvis St., Massena, NY 13662

The Niagara Falls Commodore/IBM Club, 2405 Willow Ave., Niagara Falls, NY 14305

Rainbow Computer Users Group, c/o St. James United Methodist Church, 4661 Por-

ter Rd., Niagara Falls, NY 14305

Geneva Commodore Users' Group, 25 Pine St., Geneva, NY 14456

Commodore Users Group of Rochester (CUGOR), P.O. Box 23463, Rochester, NY 14692 (BBS# 716-621-5908)

NORTH CAROLINA

Triad Commodore Users Group, P.O. 10833, Greensboro, NC 27404

Bailey's User Group (BUG), P.O. Box 70, Holly Springs, NC 27540

Commodore Users Group of Lincolnton, Rte. 3, Box 457, Lincolnton, NC 28092

Salisbury Compute, Charles A. Huffman, 280 Deal Creek Dr., Salisbury, NC 28144

Asheville-Buncombe User Group (A-BUG), P.O. Box 15511, Asheville, NC 28813

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Ashtabula County Commodore Users Group (ACCUG), 1034 Michigan Ave., Ashtabula, OH 44004

Basic Bits Commodore Group (BBCG), P.O. Box 447, N. Ridgeville, OH 44039

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Akron Area Commodore Users Group (AACUG), P.O. Box 9293, Akron, OH 44305-9293

Trumbull Commodore Users Group (TRUMCUG), P.O. Box 8632, Warren, OH 44484

Mahoning Valley Commodore Club, P.O. Box 1180, Young-

stown, OH 44501

Canton/Alliance/Massillon Users Group (CAMUG), P.O. Box 2423, N. Canton, OH 44720 (BBS# 216-453-3319)

Computer Erie Bay Users Group (CEBUG), P.O. Box 1461, Sandusky, OH 44870

Shelby Computer User Group, P.O. Box 512, Shelby, OH 44875

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Cincinnati Commodore Computer Club, c/o Cure of Ars School, Berwick and Roe Streets, Cincinnati, OH 45227 (Voice# 513-248-0025)

Southwestern Ohio Commodore Users Group (SWOCUG), P.O. Box 46644, Cincinnati, OH 45246

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Chillicothe Commodore Computer Users Group (ChilCUG), P.O. Box 6014, Chillicothe, OH 45601

Hancock User's Group (HUG-64), P.O. Box 632, Findlay, OH 45839-0632 (BBS# 419-423-6648)

OKLAHOMA

Commodore User's Group of Lawton, P.O. Box 3392, Lawton, OK 73502

Commodore Users of Bartlesville, 1920 SW Santa Fe, Bartlesville, OK 74003 (BBS# 918-336-3872)

Tulsa Area Commodore Users Group (TACUG), P.O. Box 52473, Tulsa, OK 74169-1842 (BBS# 918-428-2284)

Osage/Kay Commodore User's Group (OKCOM), 317 Woodbury, Ponca City, OK 74601

OREGON

geoMETRIX, 20224 S. Sprague Rd., Oregon City, OR 97045-9641

Commodore East County (C.E.C.), 1714 SE 35th Ave., Portland, OR 97214-5039

Crash-64 Salem Area's Commodore User's Group, P.O. Box 241, Salem, OR 97308 (BBS# 503-585-3092)

Lane County Commodore User Group (LCCUG), P.O. Box 11316, Eugene, OR 97440

Coos Computer Club, 2175 Everett St., North Bend, OR 97459-2336 (Voice# 503-756-4408)

PENNSYLVANIA

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Castle Commodore Computer Club, P.O. Box 961, New Castle, PA 16103

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Blue Juniata Commodore Users Group, 23 Oakland Ave., Lewistown, PA 17044 (BBS# 717-248-4877)

Huntingdon County Hackers, P.O. Box 132, Mill Creek, PA 17060

Harrisburg Area Computer Group, 721 S.

29th St., Harrisburg, PA 17111 (BBS# 717-558-9080)

White Rose Commodore Users Group, P.O. Box 7501, York, PA 17404-0501

Lehigh Valley Commodore User Group, c/o Fred Knerr, P.O. Box 2, New Tripoli, PA 18066 (Voice# 215-298-2516)

Scranton Commodore Users Group (S.C.U.G.), P.O. Box 244, Scranton, PA 18501-0244 (BBS# 717-489-8001)

EPA Commodore Users Group, Edward H. Cohen, 1712 Aidenn Lair Rd., Dresher, PA 19025

Horsham Amiga/64, 20-A Lumber Jack Cir., Horsham, PA 19044

Main Line Commodore Users Group (MLCUG), 1046 General Allen Ln., West Chester, PA 19382 (BBS# 215-354-9750 and Voice# 215-388-1581)

Worldwide Commodore Users Group (International Headquarters and Shareware Registry), P.O. Box 337, Blue Bell, PA 19422

Buxmont Commodore and IBM Users Group, 1206 Cowpath Rd., Hatfield, PA 19440

Antelope Valley Commodore Users Group, P.O. Box 4436, Lancaster, PA 17603 (BBS# 805-272-9140)

RHODE ISLAND

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SOUTH CAROLINA

Greenville Commodore Users Network (GCUN), P.O. Box 5272, Station B, Greenville, SC 29606

SOUTH DAKOTA

Amiga and Commodore 64 Users Group, P.O. Box 18, Vermillion, SD 57069 (Voice# 605-624-3471)

TENNESSEE

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Southmost In Texas Commodore User's Group (SITCOM), c/o Charles Duncan, 74 Laura Ln., Brownsville, TX 78521

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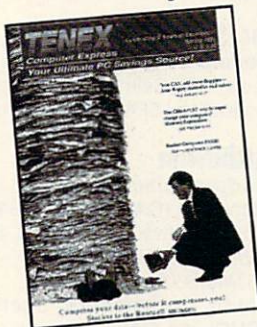
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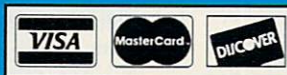


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BACK TO THE FUTURE II

Join Marty McFly as he travels through time again in *Back to the Future II*. The movie tells the comic, disjointed story of time travel in Doc's DeLorean time machine. The software is mostly an arcade game with a couple of puzzles added.

The object of the game is to make your way through five levels of play to retrieve a sports almanac stolen by old Biff in 2015 and given to young Biff in 1955. Three of these five levels are simple arcade games, and two are logic puzzles. While the idea is intriguing, the program promises more enjoyment than it delivers. The documentation, which is brief but well written, ties the game to the movie by describing the film's opening scene and then provides the user with background information about each play level.

The game opens with some elegant graphics sequences. On the first level you must maneuver a hoverboard (a flying skateboard) through the streets of Hill Valley in the year 2015. Your mission is to reach the town hall before running out of time or depleting your energy.

Maneuvering the hoverboard is simple and fun. You can move freely in all directions, accelerate, brake, and jump. It is essential to learn to time these last two maneuvers accurately, since you must sometimes wait for power points as they drop from the sky. Try learning to attach yourself to the back of a passing car for a joyride.

When you reach the pond at the end of the last street, you'll know how to get to the town hall and complete the mission if you've seen the movie. Anyone who hasn't

seen the movie will still quickly figure out how to complete the first task. Running out of time never seems to be an obstacle. Your time is extended whenever you reach the end of any of seven streets that lead to the town hall.

Maintaining your energy

um earns you the most points.

To aid you along the way, speed, acceleration, and power bonuses regularly drop from the sky. Do not miss an opportunity to gather power points, as these will restore all lost energy.



Marty McFly can hitch a ride through danger-filled streets.

level, on the other hand, is considerably more difficult. A roving gang on hoverboards, old Biff with his cane, stray dogs, cars, mobile trash cans, and radio-controlled hovercraft harass you along the way. Coming in contact with any of these enemies lowers your energy level. You can punch your opponents on the hoverboards, but it seems better to avoid gang members rather than confront them.

Cars, dogs, and hovercraft are sufficiently powerful to knock you from your hoverboard in one shot if you run into them head-on. Manholes, slick spots, and curbs do limited damage. Along the way you can pick up caps, shoes, soda cans, newspapers, or plutonium for extra points. Perhaps because of the obvious danger, scooping up the plutoni-

The best overall strategy is to remain near the middle of the screen, pick up all items in the street, avoid all items on the sidewalks, and use quick, lateral movements to evade obstacles. Background graphics are bright, colorful, and well conceived, but sprites are jagged with muddy colors. It is fascinating, however, to watch the coordination of so many sprites with the smoothly scrolling backgrounds, but the program is not without flaws. Your hoverboard can move faster than the background, so when you reach the edge of the screen, you have to wait for the background to catch up. Occasionally, the action on the screen overwhelms the computer, making the soundtrack and character movement erratic.

The second level is a log-

ic puzzle in which you must get Marty's girlfriend, Jennifer, out of a house without her being detected. You control both Jennifer and the other people in the house by opening doors two at a time. When a door is opened, a room's occupant will move to an adjoining room. At no time should Jenny share a room with anyone.

The house is viewed from above, making it difficult at first to differentiate the characters, but Jenny is the one on the far left. You are expected to race the clock while planning your solution, but the Run/Stop key turns off the clock, so running out of time is never a problem. This level is a nice change of pace because it requires more planning than reflex action. The puzzle, however, is not very challenging. The third level is a return to arcade action with a special emphasis on violence. The object is to reach the end of the street safely, avoiding armed villains, flying barrels, rocks, and Frisbees. Your various karate kicks and punches can eliminate most enemies, but the individual with the semiautomatic weapon is virtually impossible to conquer or pass. This level's use of gratuitous violence is a disappointment, and its connection to the movie's story line is tenuous. The fourth scene also is linked weakly to actual movie action, but it takes a more imaginative turn. Here you are to solve a sliding block puzzle while racing the clock. One added twist is that the block puzzle is animated.

The fifth level is another street race in which you must retrieve the stolen almanac. The toughest part of this level is reaching it. Saving games in progress is not a feature of this program, so you must complete the first

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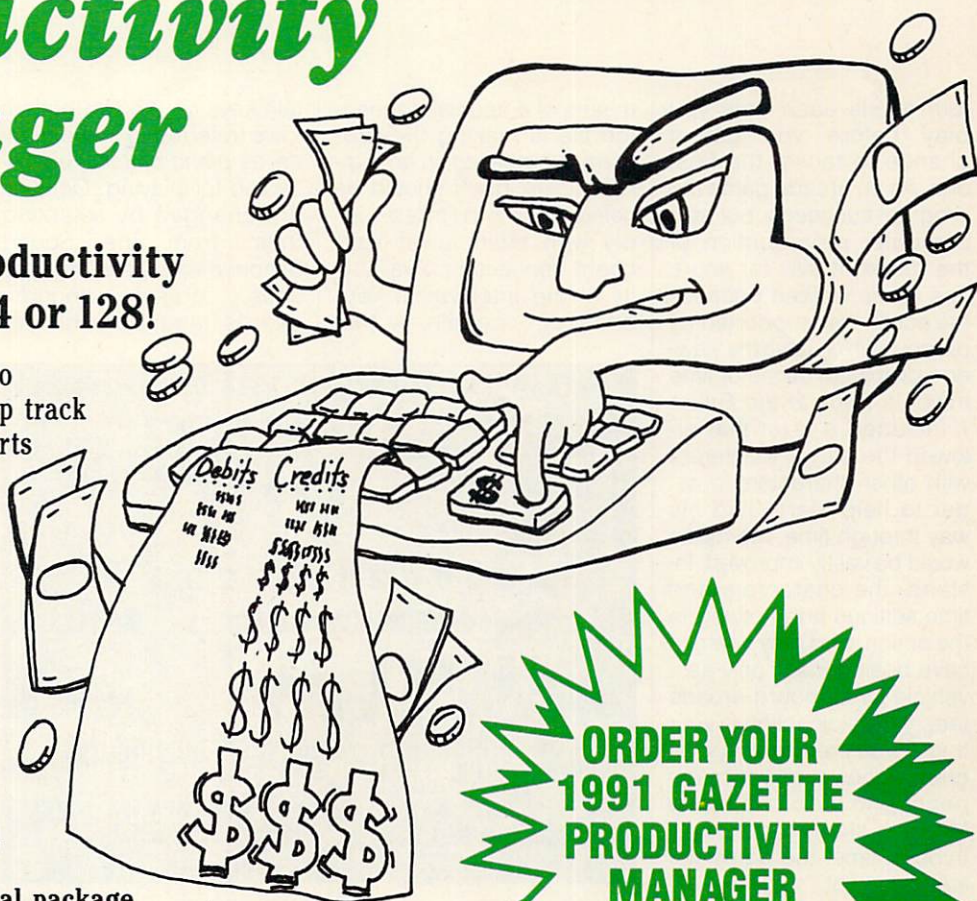
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four levels each time you play before you get a chance to tackle the final one. As an arcade game the program succeeds, but as a computer reproduction of the movie, it falls far short. The movie worked because the action was supported by dialogue which gave the viewer a disjointed sense of time travel. If *Back to the Future II* included a level that allowed the player to interact with other characters in order to help Marty find his way through time, the game would be vastly improved. Instead, the characters and time settings add nothing to the action, and they seem to have been chosen only as a vehicle for standard arcade fare. If joystick action is your thing, you'll enjoy this program. If, however, you're expecting to step into Marty McFly's shoes and warp through time, the game will leave you flat.

JIM SMITH

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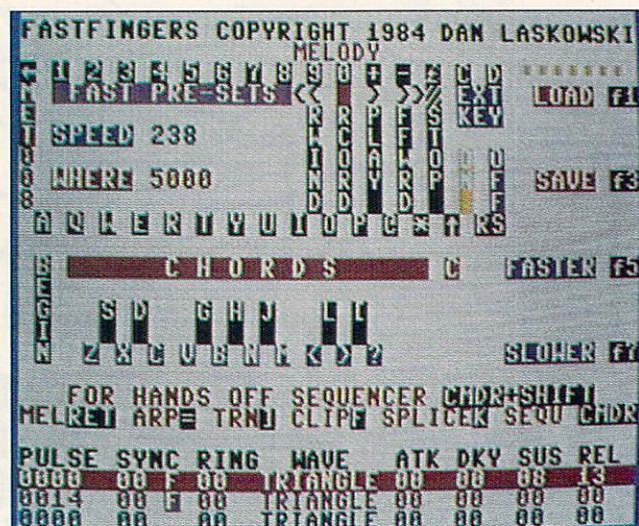
FASTFINGERS

Students of sound, take note: If you're interested in shaping sounds or learning about synthesis and if you have access to a Mattel Intellivision keyboard, check out *Fastfingers*.

Dan Laskowski developed this program (originally in 1984) with two basic thoughts in mind: to explore the sound synthesis abilities of the 64 SID chip and to allow the 64 to act as a lead synthesizer when attached to a full-size external keyboard by

means of a special connector. He is making the program available again on a direct basis, but it should be noted that it is in limited supply with even fewer keyboard connectors. Availability of the Intellivision keyboard is uncertain. At this

tain keys on the two bottom rows (referred to in the manual as *piano buttons*) are reserved for playing. Octaves are changed by selecting them from the Sound Shaper menu. Other keys access preset sounds, chords, and a sound se-



Learn more about sounds and music with *Fastfingers*.

writing, Laskowski has three of them and will sell an entire package for \$119. With an eye (or is it ear?) toward reaching student musicians, he offers special rates to music educators.

Because it is somewhat dated, *Fastfingers'* presentation is not as slick as those of some other programs. Its four menus are a bit crowded and clunky-looking, but you get used to them. The sounds, which are the important part, are amazing. *Fastfingers* was written before the MIDI explosion, yet Laskowski programmed it for 256 sounds and even coaxed an extra suboctave out of the SID chip.

While developing sounds and recording a track on disk are clearly easier with an external keyboard (not tested here), the computer keyboard is sufficient. Cer-

quencer; permit loading and saving sounds from disk; and allow you to record, play back, and control sounds you've created.

This first menu, Play Mode, is the default when no control keys are pressed. Pressing (and holding) Shift pulls down the Sound Shaper and Effects menu, the Control key pulls down the Sound Banks, and Control/Shift accesses the Sound Shaper.

The preset sounds are simply eight sounds taken from the sound bank for easy access. You can use these, replace them with others from the bank, or create your own and install them. One-finger chords are available: three major chords, three minor ones, and six others. The chords can be canceled at the press of a key, which causes all three voices

to play the same note in unison. The sound sequencer allows you to trigger arpeggios to play automatically.

To simplify things, Laskowski makes use of the familiar style of a cassette recorder's buttons to record, rewind, fast-forward, and play your works. On playback, adjustments can be made to speed and sound. With this you can create melodies, arpeggios, and even record a "walking bass line" by means of the transposer function. Once you have laid out your sounds the way you want them, recorded your melody, and arranged your transposer and arpeggio, you can save the whole arrangement to disk. This Save is an old-fashioned save which dumps everything onto a disk under the lump title Sounds. This limits you to one file per disk, and the manual recommends dedicating the disk to Sounds only, although you could probably use it to save something not connected with *Fastfingers*.

If this is sounding too technical for you, it gets more so. Now we come to the heart of this program: building sounds. While not sophisticated enough to include an on-disk tutorial (this is only a one-disk program), the *Fastfingers* manual guides you through modifying existing sounds and creating new ones. One chapter shows you how to play with such effects as Flang, Pulse Width Kick, Glide, Thicken, Weow, Swirl, Wah (1&2), Tremolo, Pswirl, Vibrato, Phase Shifter, and Digital Distortion. Effects are software effects used to simulate or replace hardware effects, and they work on all three voices.

Another chapter teaches you about building sounds,

beginning with the selection of voice 1, 2, or 3. You learn about adjusting the oscillators up and down in semitone increments, selecting waveforms, using harmonics, using (or bypassing) filters, and adjusting the ADSR (Attack, Decay, Sustain, and Release). Students of sound with the patience to check out each minor adjustment will have a wealth of sound to explore.

The dearth of new software for the 64 has sent developers back to their closets to have another look at older programs to see if there's something to dust off and reissue. *Fastfingers* is one such program, and the question arises, does it still stand up? We are compelled to give a qualified Yes.

There are musical programs with far slicker presentations. The tutorial and animation in the Sight and Sound 3001 series leap to mind. *Fastfingers* lacks feedback in that it doesn't tell you what sound (preset or sound bank) or even what octave is in current use. It seems to us, particularly if you are using this setup in performance as Laskowski says you can, you ought to have an onscreen reminder of what you've selected. On the other hand, the range of sounds is almost mind-boggling. Providing for the use of a 48-key external keyboard is a unique touch that may send some young musicians hunting through the classified ads to pick up a used one.

Laskowski is first a musician, a fact that becomes obvious when talking with him or reading his manual. Although certainly not the only person to envision the 64 as a synthesizer, he is the only one to take it to this degree. In *Fastfingers* he has

taken an unusual slant on the 64 and developed a 64 oddity, a program that's certainly not for everybody, but will certainly intrigue those with an interest in music.

DAVE and ROBIN MINNICK

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NIGHTBREED

From out of the dark shadows of your mind came the mystical thriller *Nightbreed*, a movie that had people holding tightly onto their seats. Now, it's your joystick that you'll want to grab tightly because *Nightbreed* is now an arcade game on your 64.

You assume the role of Boone, a guy with some psychiatric problems, and begin your journey at the gates of Necropolis, a local graveyard. The object of the game is to save the *Nightbreed* from an evil organization that calls itself *Sons of the Free*. Who are, or what is, *Nightbreed*? *Nightbreed* is a race of beings older than mankind, who possess the power to change shape and form.

Once the game begins, you'll constantly be challenged with different objectives. Even though it's an arcade-type game, you must complete many different tasks before progressing to a different level of play.

At the bottom of the screen is the game's status panel. Here you'll find valuable information to help you during play. There's a list of objects in Boone's possession, as well as a power level that indicates his injuries, life number, and status as ei-

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ther monster or man.

You control Boone with a joystick to punch, kick, or shoot your way past the many different creatures that pursue you. Each confrontation with a monster will have different challenges for you to overcome. For example, I found the Fatman fairly simple to overcome, yet the

Sons of the Free were challenging, using everything from rocket launchers to grenades in an attempt to stop me. Also, you'll find each enemy has a unique power that makes it dangerous. The Fatman moves slowly, but he vomits, and the vomit is poisonous to the touch. Since this is an arcade-type



Should Boone defeat the grenade tosser, he still must defuse the time bomb before he can continue his quest to save the *Nightbreed*.

thriller, you can expect other gross experiences throughout the game.

In your path you'll encounter such graveyard charmers as the Snakeman, the Hopper, Flying Teeth, a Head Monster, and a Roof Crawler. This last fellow delights in dropping rocks on you.

One unique feature you will find is the passkey which allows you to skip certain parts of the game. The key is a password-type system that uses graphics instead of text. You create a passkey from various pieces displayed on the game's background scenes. Using the correct key allows you to skip to certain points in the game.

Making a map of the game is also useful. The game can be confusing if

you don't know where you've been or where you need to go. As with many games of this type, you can move in a variety of directions and encounter a number of foes as your hero attempts to complete his quest. A map helps you avoid many blind alleys.

At first glance I thought that *Nightbreed* was going to be a simple arcade game and that completing it would be an easy task. I was wrong. It provides plenty of nonstop action that should have you grasping your joystick for quite a few hours of nerve-wracking play.

The graphics are very well done, and the game remains true to the movie's theme. If you're looking for a good action-packed game, then turn down the lights,

grab some popcorn, and boot up a copy of *Nightbreed*!

JEFFERY SCOTT HALL

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POWER DRIFT

For a fast-paced, hard-edged race through five different road courses, try *Power Drift*. Pit your skills in this arcade-style release from Activision against 12 other racers who are out to win at all costs. Speed through hairpin turns at over 200 kph and

plunge over hills into steep drops, just get to the finish line first.

At the start of the game, choose the race terrain you want and a driver. Terrains include city, beach, desert, countryside, and riverside. There's also a wide selection of male and female drivers from which to choose.

As the starting lights turn from red to green and the race begins, the other drivers will leap ahead of you. Push forward on your joystick to accelerate. This will take you to about 130 kph. Change from low to high gear by pressing the firebutton. In high gear your car reaches its maximum speed of 224 kph. Pulling back on the joystick acts as a brake, but with a little practice you'll

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be able to maintain top speed throughout the entire course. Just watch for other drivers.

As you progress around the course, your time, speed, position, and lap number are posted at the top of the screen. To advance to the next round, you must place in the top three finishers. Racing in the higher rounds is more difficult and there's a greater possibility of ramming other drivers. When this happens, the result is a dramatic spin-out with you hurtling across the course. When your car finally comes to a halt back on the road, try to make up lost time. Don't overdo it or you'll end up in another spin-out.

As long as you keep placing within the top three, you'll

continue advancing to higher levels. Finish back in the pack and the race is over. One of the best features of this game is that it restarts very quickly. You don't have to sit and wait for it to reload every time. At the end of a game you can try another course and change drivers if you want.

Power Drift's graphics are colorful and interesting, but if you have any intention of placing in the top three, you won't have time to notice your surroundings or the scenery as it flies by. One interesting effect is the road; it seems to be suspended in air. There are no guard rails and on hills the road often drops like a rollercoaster. Watch out for those blind drops though. A car could

be just over the crest and if you bump one at high speeds, you could go crashing off the road.

There is a steady, pounding pulse to the background music that keeps you racing through the turns and hills. Even when you're adding your name to the list of high scorers, the powerful beat continues. It complements the action as you move through the courses.

The player's guide is easy to understand. It explains how to load the program and how to use the joystick. All you have to know is which direction to push or pull the joystick and how to change gears. It's all clearly explained in the manual.

In all, *Power Drift* is not a game to play for hours on

end, but it is fun. There's plenty of white-knuckle action as you speed around each course and drift through the corners. Tension builds as you progress. The first few races are fairly easy and the courses somewhat forgiving, but accidents become more frequent and the amount of driving skill needed increases as you advance to higher levels.

So, wait for the green light, happy racing, and don't forget to buckle up!

ALISON CHRISTENSON

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Questions and
answers
about converting
programs
from Commodore
format to
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Three Questions

Is it possible to convert Commodore type-in programs to IBM-compatible format in a relatively easy way for those with limited knowledge of GW-BASIC or machine language programming?

As I am changing over to a PC, am I right in assuming that an alternative version of *COMPUTE* that is PC specific and excludes the Gazette section will be available?

From my current address label on my magazine, do I surmise correctly that my subscription is current through June 1991?

C. W. M. ANDERSON
SANDTON, SOUTH AFRICA

Commodore BASIC and GW-BASIC are similar in many respects, and some elementary programs entered in one language will run if entered into the other. Simple print statements, mathematical formulas, and commands such as GOSUB, GOTO, IF-THEN, and FOR-NEXT pose few problems when making the change from one version to the other. Problems arise, however, when it comes to colors, machine language routines, PEEKs and POKEs, and other commands that are machine specific. Some commands in BASIC 7.0 for the 128, for example, would cause a 64 to crash. There are ways around many of these problems, but it usually takes a good working knowledge of BASIC to make the conversion work.

*If you are subscribing to *COMPUTE's* Gazette edition, you already are receiving all the PC-related material that we publish each month. There's no reason to change your subscription unless you want to drop the 64/128 coverage; the price is the same. Some *COMPUTE* subscribers, however, do not get the 64/128 material.*

The month and year printed on address labels indicate the final edition of your current subscription. Since the June issue was the last one you were scheduled to receive, I hope you renewed your subscription in time to read this reply.

What's a Koala?

I subscribe to *Gazette Disk*, and I enjoy your "Gallery," but, forgive me, what is a Koala? I gather that it is more than a marsupial. Do you need light pens or a mouse to create graphics with it?

One more comment. Could you explain why your new GOS (Gazette Operating System) menu on *Gazette Disk* will not allow me to directly load any previous *Gazette Disk* programs? It gives the disk information, but the selection turns blue and sits there.

JOSEPH RUFFINI
NORANDA, PQ
CANADA

A KoalaPad is a graphics tablet that connects by cable to a 64's joystick port. With its accompanying software, you can create colorful pictures on-screen by moving your finger or a stylus across the pad's surface just as if you were drawing a picture with pencil and paper. The pad is no longer in production, but used units can often be found. Its multicolor format is a popular one with Commodore artists.

The new Gazette Operating System is compatible with pre-GOS disks, so you should be able to run programs from them. Load and run the menu program that contains GOS; then swap disks. Now click on the disk icon. When the disk menu appears, click on Directory. GOS will read the current disk's directory and print it in a window. Scroll through the titles and click on the program

you wish to run. The red band highlighting your selection will turn blue. Click again on the disk icon and select Run Program when this window opens. GOS has been streamlined to make it operate faster than it did originally, but you should still be able to access and run other disks. It also lets you copy disks and files, delete and rename files, obtain disk and program information, print files, and perform numerous other applications with joystick or cursor keys.

Wide Open Spaces

I have recently started typing in a few Gazette programs with *The Automatic Proofreader*. Since I am not a programmer, my understanding of what I am typing is rather limited. Because the listings in your magazine are printed in columns, it is not always clear when to leave spaces.

HANS SPARREBOOM
TOFIELD, AB
CANADA

When entering programs in Commodore BASIC, spaces are usually optional. Programmers may put spaces between words, variables, or commands in their listings to make them more readable, but the computer doesn't require them. Most programmers do not include spaces simply because it saves space, computer memory, and typing time. If they leave them in and a column line begins with a space, our listing program will usually print the word SPACE within brackets. Since most spaces are optional, The Automatic Proofreader ignores them also unless they fall between quotation marks. To illustrate, load and run Proofreader; then enter the following statement.

100 IF A\$ <> "Y" THEN 100

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In English the line reads, "If A-string does not equal the letter Y, then go to line 100." This line could be used in a statement to halt a program until the letter Y—and only the letter Y—on the keyboard is pressed.

Proofreader should print MJ in the upper left corner of your screen when you press Return. Now go back, delete all the spaces, and press Return again. You should still get MJ, indicating the line is still entered correctly. Spaces make code easier to read, but often they are optional to the 64.

Now go back and insert a space after the first quotation mark and in front of the Y and try it. Proofreader will return a different value this time because "Y" is not the same thing as "Y" and it would affect how the program runs.

Diary Needed

I'm an active 14-year-old looking for a 64 program that is a diary.
BRIAN S. MULCAHEY
HAMILTON, OH

Almost any word processor could be used as a diary. You could write as little or as much as you want and then save each entry with a filename that represents the date, such as SEP20. There is a program called Notepad 64 (November 1988) that could prove useful. This machine language program resides in

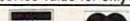
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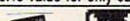
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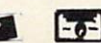
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memory while your computer is working on another BASIC program. This means you can call it up at the touch of a key, jot down some thoughts, and then continue with your BASIC program. You can also save the notes with any filename you like. One limitation to the program, however, is that each note can be no more than 1000 characters in length. That's enough to fill one screen. Back issues of this disk and any other Gazette Disk prior to October 1990 can be ordered from our Greensboro, North Carolina, office for \$5, plus \$2 for shipping and handling.

Worldwide User Group

I am working to start a worldwide association of Commodore user groups. As support for the 64 dwindles, user groups play a more important role in supplying users with help and information. I believe an association of user groups would be beneficial, especially for smaller groups.

I would love to hear from user groups who would like to help me organize this group or who would like to join it. Just drop me a line, and I'll bring you up-to-date on what's happening so far.

JOSH JACOBY
98-1689 HAPAKI ST.
AIEA, HI 96701

Keep Gazette posted about your activities, Josh. User groups represent a great resource of information for Commodore users, and we encourage their growth. In this issue we finish our two-part listing of user groups in the U.S. and other countries. If you are not already a member, we recommend you contact a group in your area or see about joining one by mail.

Back to the Boards

Rick Lembrée's article on

BBSs (March 1991) was an excellent introduction to what has become one of the last bastions of dedicated Commodore users. Using a BBS is the best way possible to support each other and enjoy the potential of the still-powerful 64s and 128s.

Volunteering as a sysop is a rewarding experience, not only for the knowledge gained, but for the enjoyment of knowing that you are providing others with a medium for sharing and communicating. If you want to try your hand at running a board, there still are plenty of potential members out there who would eagerly join a new board. I especially urge Commodore users to participate on a local BBS. Any computer user who doesn't is missing out on an excellent resource of knowledge and entertainment that is easily available to anyone with a modem. I'm sure many COMPUTE readers would be interested in reading more articles about operating a BBS, as well as about the many features different boards have to offer.

FREDERICK T. MERRITT
ST. PAUL, MN

At the end of your BBS article in the March issue, the supplier of the C-Net system was listed incorrectly. The correct name is Perspective Software. The BBS number for support of this package is (313) 981-1524. Also, I feel that this system was not given enough credit as a commercial BBS available for the 64.

JEFF FENSTERMAKER
NEWBURY, OH

Thanks for bringing the correction to our attention, Jeff. Because C-Net was last on our list of commercial systems for the 64 does not mean it was considered the least. We sim-

ply tried to list as many of the current BBS products as we could find for our readers' convenience, and on any list someone has to be last. The listing was not meant to be an endorsement by either Mr. Lembrée or Gazette.

Bug-Swatter

Several readers wrote in to say that they have experienced problems with *Cross Aid* (March 1991) when they try to use Shift-D to delete misspelled or unwanted words. The documentation was not clear in stating that you must first enter maintenance mode by entering the word that's to be deleted, followed by Shift-Return. The delete function can be invoked by pressing Control-D to erase the word.

Several readers also informed us of a problem with *Castalia* (May 1991). We discovered it has a peculiarity that affects some machines at some times. The problem causes the screen to go blank when you first run the program. If you experience this situation, there is no danger or programming fix required; just try running the game again. On the 128, the problem is especially easy to fix. If the problem occurs, it only does so when an attempt is made to run the program for the first time after powering up. If this happens, reset the computer to 64 mode by holding down the Commodore key while pressing the reset button. You should have no problem the next time the program loads.

If you have a question, comment, or problem, we want to hear from you. Send your letters to Gazette Feedback, COMPUTE Publications, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. □

Steve Vander Ark

GO ONLINE WITH GEOS

This won't come as a big surprise to many of you. If you haven't already discovered it, you've certainly read articles on the subject or heard computer users expound about it. *It is telecommunicating, and it is great.*

It's great, but it's also confusing, intimidating, and a whole lot of other things that keep many people from plugging in a modem and dialing up a bulletin board system (BBS). I avoided telecommunications for these reasons for a long time. I was afraid I would make a fool of myself trying to learn my way around. I thought I'd find a hostile world full of people who were in the know and wouldn't be too happy dealing with a novice poking around at 300 baud.

Boy, was I wrong. When a friend finally convinced me to hook up his modem on my 128 and I timidly dialed a local BBS number, I had no idea what a giant leap I was taking. Over the next four months, I discovered a lot of new computer friends who didn't give a hoot that I needed to call up a menu every time or that I accidentally logged myself off when I meant to upload a file. They offered support, advice, a little good-natured teasing, and friendship.

Now I'm online all the time. This electronic alternative reality is populated by a wide variety of users. They call using IBMs, Macs, Amigas, and, of course, Commodores.

That's where GEOS comes in. It wasn't long before I discovered a number of people on various local BBSs who shared my enthusiasm for GEOS, and we began comparing notes. We exchanged ideas, gave each other hints for using various applications,

and swapped utilities downloaded from other BBSs.

But telecommunicating with GEOS requires some special rules. GEOS has its own unique way of running a Commodore computer, and terminal software and bulletin boards aren't designed to handle the differences. The stumbling block is the structure of GEOS disk files. A file exists on a disk as a scattering of individual blocks of data, linked together with predefined coding. GEOS uses a different code from the one built into the 64's system, which means that if you try to use normal Commodore file commands on a GEOS file, the system won't know how to put the various chunks back together. That's why you can't copy a GEOS file using a normal file copier; the same is true for uploading or downloading.

In order to send or receive a GEOS file by modem, it must be converted temporarily into Commodore DOS-compatible format. William Coleman has written a conversion utility called *Convert*, which has become something of an unofficial standard for handling GEOS files online. This utility should be the first GEOS file you download. It can be loaded and run with BASIC and will convert a program or sequential file to one that can be used by GEOS. Once you have *Convert*, you're in business.

Any GEOS file you download using your normal terminal program will be a standard sequential or program file until you switch into GEOS and run *Convert*; the whole process takes a matter of a few seconds. *Convert* can work both ways. If you have a GEOS file that you'd like to upload, you can convert it into a sequential or program file that your terminal program can handle. *Convert* can be found on Quan-

tumLink and on many local BBSs. (*File Converter* is a similar program published in *COMPUTE!'s Gazette*, April 1989.) If you'd rather stay in GEOS without returning to the Commodore DOS, there is one terminal program available which operates within the GEOS environment. It includes the *Convert* utility as an option, which makes handling GEOS files a breeze. This program is called *geoTerm*. It, too, was written by Coleman, with versions available for the 64 and the 128. Each version includes many features, including a 9K capture buffer for the 64 and a 30K buffer for the 128, programmable function keys, built-in utilities to convert the buffer to and from true ASCII and PET ASCII, as well as the above-mentioned *Convert* program.

The screen can be run in 40, 53, or 80 columns. You can also access either drive for uploads or downloads, scratch files, and so on.

Whether you use *geoTerm*, available from *RUN* magazine, or another terminal program, you'll find many GEOS users out there who are glad to hear from you. BBS Post, a bulletin board in Michigan, has a GEOS file area. The sysop, Bismark, says he gets more calls for the Commodore area on his IBM board than for any other. I've put many of the public domain utilities mentioned in this column on BBS Post. If you call long distance, you may download GEOS files on your first call. The number is (616) 531-1346.

For the price of a long distance call, it's not a bad place to start. But there are probably people on bulletin boards right in your hometown who would love to hear from you. Why not give them a call?

Steve Vander Ark can be reached on QuantumLink. His handle is SteveV14. □

Telecommunicating with GEOS requires special attention. Here are some tips to make the process easier.

MACHINE LANGUAGE

Jim Butterfield

GIVE IT A NUDGE WITH BINARY FRACTIONS

BASIC uses a number system called *floating point* (or *scientific notation*), which is powerful but complex to code in machine language. Often, you can accomplish what you need through the use of fixed-point binary fractions.

In conventional base 10 mathematics, if you divide 7 by 3, the answer is 2 with a remainder. But if we continue the division, we establish that 7 divided by 3 gives 2.33333 . . .

Exactly the same thing happens in binary calculations. In binary, we might write $7/3$ as $\%111$ divided by $\%11$; using any of several division methods, we produce a first result of $\%10$ with a remainder of 1. But if we don't stop at the "binary point" equivalent of a decimal point and provide somewhere to store the extra fractional result, we will generate $\%10.01010101 . . .$ and cut off the endless fraction.

In hexadecimal notation, $1/2$ works out neatly as \$.80, but $1/3$ is the repeating series \$.555 . . .

You've noted that you must trim an endless value at some point. In machine language coding, that amounts to deciding how many bytes you will use to hold the fractions. Roughly speaking, each byte gives the equivalent of 2.4 decimal digits of accuracy.

Binary fractions fit nicely into the whole scheme of math coding. Such numbers add, subtract, multiply, and divide in the same way as integers. For example, you might want to multiply a value by 8 and then divide by 5 to convert miles to kilometers.

Perhaps the most popular use of binary fractions is to

nudge an integer value higher. For example, suppose you started with zero and added a value of $1/3$ repeatedly. The integer part would bump to the next higher value every three operations. This kind of nudging has many applications in programming.

A programmer might be handling one or more sprites; each sprite is expected to move from time to time. How do we control its speed? Suppose we want it to move gradually, without leaping across the screen. Let's say we just want to nudge its position. By repeatedly adding fractional values to its location, we will eventually cause the sprite's location to move to the next pixel at regular intervals.

When working in high-resolution graphics, it's often desirable to draw a line that's not quite horizontal (or vertical). Binary fractions will help us do the job.

To create a line that's almost horizontal, you want to step across the horizontal (x) coordinates, but how do we plot the vertical (y) coordinates for each line? Nudge the y coordinate value. If the line were 50 pixels wide by 10 pixels high, you'd nudge the y coordinate by a value of $1/5$; as you sweep across the 50 x pixels, the y coordinate would travel exactly the 10 pixels that are needed.

Let's write a small program that should be good on almost any Commodore 8-bit computer that will show this kind of calculation. You'll place a value to be nudged at address \$2100 with a fraction byte at \$2101. You'll place the nudge value at \$2102 and \$2103, then step through and show the result.

For easy display, you'll start the value at \$31 (decimal 49). This corresponds to the ASCII character 1; you can print it to show how it changes.

2000 LDA #31
2002 STA \$2100

You will add $1/2$ (\$.80) to your starting value; that allows easy rounding of the result. A hi-res graphics line would look better with this kind of rounding, for example.

2005 LDA #80
2007 STA \$2101

Now store your nudge value in \$2102 and \$2103. We will choose a value of $1/3$, hex \$00.55

200A LDA #00
200C STA \$2102
200F LDA #55
2011 STA \$2103

Now we have our values in place. We'll count our loop through 16 items (the initial value plus 15 steps).

Since we started at ASCII 49 (1), we should end up five full values further along, at ASCII 54 (6). We will use X as our loop counter.

2014 LDX #00

Following is the loop. Print first and then add; then test to see whether the loop should be repeated.

2016 LDA \$2100
2019 JSR \$FFD2
201C CLC
201D LDA \$2101
2020 ADC \$2103
2023 STA \$2101
2026 LDA \$2100
2029 ADC \$2102
202C STA \$2100
202F INX
2030 CPX #10
2032 BNE \$2016
2034 RTS

That's the whole program. To use this routine while in BASIC, type in SYS 8192 to watch the character 1 as it's nudged through its range. □

Move sprites,
draw lines, nudge
integers, and
do other clever
things with
the help of binary
fractions

BEGINNER BASIC

Larry Cotton

MAKE YOUR DATA ENTRY CRASHPROOF

The following general-purpose "crashproof" data entry subroutine can be inserted into any BASIC program in which you're asking an inexperienced user to enter data.

The first decision is whether to use INPUT or GET. INPUT is easier to program, but it's vulnerable to errant keyboard presses, such as cursor up/down, Del, Clr, and so on. It's also rudely unforgiving of unexpected input data. GET requires more programming and is vulnerable to garbage collection, a rather nasty habit Commodore computers have.

For a few simple daily entries, however, garbage collection shouldn't be a problem. So let's use GET.

First, let's have all keys repeat. It's helpful when testing the program, and it can be fun. Here's the first line which does that and clears the screen:

```
10 POKE650,128:PRINTCHR$(147)
```

Now decide on a cursor. I prefer a nonblinking one. It implies more patience. As for its appearance, take your pick. To determine which cursor shape to use, select a character from the front of the keyboard keys. Then in immediate mode, enter

```
PRINT ASC("X")
```

This will return the value of your preferred character. (See *64 Programmer's Reference Guide* for a complete listing.) I like a thick horizontal line made by pressing the Commodore key and P simultaneously. This returns a character string (CHR\$) value of

175. Two keys we want to recognize are the Return key (signaling completion of an entry) and the Inst/Del key (for correcting a typing error). These are defined as constants RS and DS respectively. CS is the cursor. The CHR\$ values are from *Reference Guide*.

```
20 RS=CHR$(13):DS=CHR$(20):CS=CHR$(175)
```

Now we'll write the crashproof data-gathering subroutine itself, which yields raw data in string form which is given the arbitrary designation of B\$. Strings can contain letters, numbers, punctuation—the works. The subroutine can begin anywhere, so let's use line 100. Then change B\$ to X\$. Using VAL with X\$, you may extract the whole string or just the numbers. You can select a portion of X\$ by using RIGHT\$, LEFT\$, or MID\$. End the program for now.

```
30 GOSUB100:X$=B$:END
```

The first thing to do with the input routine is clear out B\$; then reset the line length to zero. More on that later.

```
100 B$="" :L=0
```

Now print your cursor (defined in line 20). The semicolon ensures that anything after the cursor will be printed on the same line.

```
110 PRINTCS;
```

Here's where we use the GET statement.

```
120 GETA$:IFA$="" THEN120
```

The computer goes into a loop until the user presses a key. When any key is pressed, that single character becomes A\$. A\$ will be examined four times. The first time checks for the Return key:

```
130 IFA$=R$THENPRINTD$A$::RETURN
```

If the Return key is pressed, the cursor moves back one space, deleting itself, and then moves to the next line. The subroutine ends with a RETURN statement.

The second check is for the Del key, which indicates that the user is backtracking and erasing previously typed data.

```
140 IFA$=D$THENGOSUB210:GOTO110
```

At line 210 we start another short subroutine that will do the actual deleting. Then we want to go back to line 110 to print the cursor again. This time we're not ready to jump out of the subroutine yet; we're just deleting characters.

The third check is important but fairly complicated. We want to limit the characters which can be typed. We'll do that by examining their CHR\$ values. Luckily, the values we need are in the range of 32 to 95, inclusive. According to the ASCII and CHR\$ code chart in *Programmer's Reference Guide*, this will encompass the space, all punctuation, all the numbers, all the letters of the alphabet (capitals only), and a few odd-ball symbols, such as the British pound sign, brackets, and the left- and up-arrow keys. You can restrict that further if you wish. Here's the check:

```
150 IFA$<CHR$(32)OR A$>CHR$(95)OR A$=HR$(34)THEN120
```

Next month I'll repeat this line with a detailed explanation of it. Meanwhile, try to figure out why we don't want CHR\$(34) and what we'll do next to make your programs virtually crashproof in the hands of computer novices. □

Make your programs so user-friendly that even beginners will have no trouble entering valid data.

PROGRAMMER'S PAGE

Randy Thompson

GEZA'S PAGE

Every so often someone sends me a tip that really sparks my interest, and I may center an entire column around such a tip. Just last week I got a letter from Geza Lucz of La Jolla, California, that contained 16 great tips. Unfortunately, we don't have room for all of them, but here are 4 of the best.

Although the byline at the top of this column is mine, the credit and the "Programmer's Page" award money go to Geza. Thanks for the code!

OCEAN

This program makes the 64's characters roll like the waves in the ocean. There are sound effects, too.

```
JX 100 FOR I=49152 TO 49
      258:READ D:C=C+D:
      POKE I,D:NEXT
KX 110 IF C<>16497 THEN
      {SPACE}PRINT "ERR
      OR IN DATA STATEM
      ENTS":STOP
CP 120 SYS 49152
DA 130 POKE 54278,240:PO
      KE 54276,129:POKE
      54273,34:POKE 54
      272,75
GK 140 FOR I=1 TO 15:POK
      E 54296,I:FOR J=1
      TO 50:NEXT:NEXT
MP 150 FOR I=15 TO 1 STE
      P -1:POKE 54296,I
      :FOR J=1 TO 200:N
      EXT:NEXT
SR 160 FOR I=1 TO 600+IN
      T(RND(1)*1000):NE
      XT
KR 170 GOTO 130
XB 180 DATA 120,169,35,1
      62,192,141,20,3,1
      42,21,3,169,1,141
      ,18,208,133,251,1
      33,254
XH 190 DATA 173,17,208,4
      1,127,141,17,208,
      169,129,141,26,20
      8,88,96,173,25,20
      8,141
JB 200 DATA 25,208,48,7,
      173,13,220,88,76,
      49,234,166,251,23
      2,232,232,232,232
      ,232
EH 210 DATA 232,232,142,
      18,208,134,251,22
      8,254,208,4,230,2
```

```
51,230,254,166,25
3,232
CD 220 DATA 138,41,15,17
      0,134,253,189,91,
      192,141,22,208,76
      ,188,254,200,201,
      202,203
BS 230 DATA 204,205,206,
      207,207,206,205,2
      04,203,202,201,20
      0
```

FREEZE!

This short machine language routine freezes program execution whenever you hold down the 64's Shift key. You can load and run almost any program and use Shift as a Pause key. If you need to pause a program so you can go off and answer the phone, the Shift Lock key keeps the software frozen until you're ready for it. This freeze feature is also great for programmers who need to pause the computer when listing their programs to the screen.

```
EX 100 FOR I=49152 TO 49
      191:READ D:POKE I
      ,D:NEXT:SYS 49152
HF 110 DATA 120,169,26,1
      62,192,141,20,3
KG 120 DATA 142,21,3,88,
      96,120,169,234,16
      2
EF 130 DATA 49,141,21,3,
      142,20,3,88,96,32
SR 140 DATA 135,234,174,
      141,2,224,1,240,2
      46
HP 150 DATA 76,49,234,0
```

COMMAND HIGHLIGHT

Another practical utility is this program that highlights all of the commands in a BASIC listing. Line numbers and variables appear in the usual blue color, while BASIC commands appear in white.

```
CC 100 FOR I=49152 TO 49
      230:READ D:C=C+D:
      POKE I,D:NEXT
CH 110 IF C<>11843 THEN
      {SPACE}PRINT "ERR
      OR IN DATA STATEM
      ENTS":STOP
CP 120 SYS 49152
MG 130 DATA 169,11,162,1
      92,141,6,3,142,7,
      3
```

```
EB 140 DATA 96,16,36,36,
      15,48,32,201,255,
      240
GP 150 DATA 28,133,251,1
      34,252,132,254,16
      6,253,224
QB 160 DATA 5,240,7,169,
      5,133,253,32,210,
      255
DG 170 DATA 165,251,166,
      252,164,254,76,36
      ,167,133
PQ 180 DATA 251,134,252,
      132,254,166,253,2
      24,154,240
DJ 190 DATA 7,169,154,13
      3,253,32,210,255,
      165,251
PP 200 DATA 166,252,164,
      254,76,243,166,20
      8,14
```

GETTING DIZZY?

A close relative of the ocean trick, this program is definitely *not* recommended for the 64 owner with a weak stomach.

```
RS 100 FOR I=49152 TO 49
      266:READ D:C=C+D:
      POKE I,D:NEXT
EG 110 IF C<>13471 THEN
      {SPACE}PRINT "ERR
      OR IN DATA STATEM
      ENTS":STOP
HK 120 POKE 16383,0:SYS
      {SPACE}49152
RJ 130 DATA 120,169,31,1
      62,192,141,20,3,1
      42,21
BE 140 DATA 3,169,0,141,
      18,208,173,17,208
      ,41
KX 150 DATA 127,141,17,2
      08,169,129,141,26
      ,208,88
AE 160 DATA 96,173,25,20
      8,141,25,208,48,7
      ,173
GS 170 DATA 13,220,88,76
      ,49,234,230,254,1
      65,254
QP 180 DATA 41,3,208,21,
      166,251,232,138,4
      1,15
KR 190 DATA 133,251,170,
      189,78,192,141,17
      ,208,189,94,192
JC 200 DATA 141,22,208,7
      6,188,254,24,25
AE 210 DATA 26,27,28,29,
      30,31,31,30,29,28
FG 220 DATA 27,26,25,24,
      203,204,205,206,2
      07,206
GG 230 DATA 205,204,203,
      202,201,200,200,2
      01,202,203,0,0,0,
      0,0
```

Here's a whole page of nifty tips for the 64 submitted by one reader.

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D'IVERSIONS

Fred D'Ignazio

ROBOTS IN DISGUISE

I was on my way to Dubuque, Iowa, last week to train a group of intrepid teachers in the art of scavenged multimedia. As I left the airplane for a layover in Chicago's O'Hare Airport, I felt the urge to make a brief stop at the nearest men's room. After I conducted my business, I made my customary stop at a washroom sink. The sink was broken. No handles on the water faucet. No water. I turned to another sink. Its handles were also missing. I turned to another sink. All the handles were missing.

Suddenly I heard the sound of running water. I turned around. Two men were standing in front of two sinks. Two water faucets were gushing gurgling water into two sink bowls. The sinks weren't broken after all!

I slipped back into the bathroom, quietly placed my bags onto the bathroom floor, and tried to appear natural and inconspicuous until the two men at the sinks had departed.

OK, I thought, how did they make the sinks work? My first guess was foot pedals. After all, there were no faucet handles, and I hadn't noticed either man touching anything on the sink. It *had* to be pedals.

I crouched in front of one of the sinks. No pedal. Maybe the pedal was tucked underneath the sink bowl. I reached under the bowl, searching for the mysterious device.

Suddenly a man walked into the room. He immediately halted when he saw me under the sink. I'm sure he was wondering what a small, bearded man in a raincoat was doing in an airport bathroom crawling around under a sink.

"Sink inspector," I said, smiling and trying to appear nonchalant. "We have to do this pe-

riodically." I kind of mumbled the last part because the fellow took a brief, critical look at this "sink inspector," smirked, and shot out of the bathroom.

I stood up, still trying to figure out how to work the sink's faucets. Maybe if I stuck my foot under the sink it would work. I lifted my leg, leaned way back, and thrust the toe of my shoe across the sink's porcelain underbelly.

Three teenagers entered the bathroom, jostling each other and laughing. However, after they saw me stroking the sink with my foot, they sank into immediate, puzzled silence.

"It itches," I said, pointing at my foot. "This is the only way to scratch it." I kept probing the fixtures beneath the sink with my toes, desperately hoping I'd soon see water flowing into the basin.

The teenagers did their business and approached a couple of sinks. Water instantly sprang from their sinks' faucets into the bowls.

I rushed over to the teenagers' sinks. "It's a miracle," I exclaimed. I dropped to my knees and looked underneath. "How'd you do that?"

"Little sensor right here, dude," said one of the teenagers, pointing at a small red oval on the wall that had escaped my acute observational powers. "It's easy. You stand in front of the sink; you get water. You move away; the water stops." The teenager stared at me and grinned. "You from some other country, maybe?"

When I was growing up in the 1950s and 1960s, computers were big, new, and frightening. In those days we were afraid that computers would one day be turned into spy machines. They would spy on us average citizens and report to "the people in power." Much of this image came from the book *1984* by George Orwell.

The future turned out to be completely different. Computers shrank from barn-sized behemoths into cornflake-sized chips. As they shrank, they disappeared—into washing machines, microwaves, automobiles, watches, toaster ovens, and bathroom scales.

Instead of a single big brother running a single big computer, we now have zillions and zillions of little computers acting as little brothers. Little computers are now quietly watching us from inside refrigerators, teller machines, filling stations, vending machines, and bathroom sinks. They help us go about our business and then patiently wait for the next human being to come their way.

For years we've been waiting for the robot revolution. We've pictured it as an electromechanical second coming with robots who look like humans, rolling off factory lines to rescue human beings from the grind and toil of daily life.

Maybe the robot revolution has already started. Except it's totally different from what we imagined. Instead of giving robots a human shape, we are quietly giving them the shape of the comfortable, familiar appliances. Remember General Electric's motto: We bring good things to life.

Maybe the being I met in that O'Hare bathroom was almost alive, a primitive precursor on a new evolutionary ladder. Maybe it was a little like *Australopithecus* or Neanderthal man, a robot from the dawn of a new generation of intelligent robots. These robots won't have to have legs, arms, or hands. They won't have to resemble humans. That would be too scary!

Instead they'll just keep evolving at a faster rate, while retaining the outward appearance of our familiar, cozy, old appliances. Except they won't have any handles! □

The robot revolution may have started in a way totally different from what we imagined.

SPANISH VOCABULARY QUIZ

By Christopher M. Stoy

Learning a foreign language can be difficult. Not only do you need to learn a new set of grammar rules, but you must also learn an entirely new vocabulary. The only way to do this is by continually repeating the new words until they become second nature.

Finding someone to quiz you on your new vocabulary can be equally difficult. After all, who wants to sit around asking you drill questions all day? That's the beauty of a computer. Your 64 is happy to help out, with software such as *Spanish Vocabulary Quiz*. This Spanish tutorial will quickly help you learn Spanish words, and it'll never complain about your poor pronunciation or your gringo accent.

Getting Started

Spanish Vocabulary Quiz is written in BASIC with a small machine language subroutine. To help avoid typing errors, use *The Automatic Proofreader* when entering the BASIC portion; see "Typing Aids" elsewhere in this section. When you've finished typing, be sure to save a copy of the program.

Enter the machine language routine with *MLX*, our machine language entry program; see "Typing Aids" again. When *MLX* prompts, respond with the following values.

Starting address: C000

Ending address: COBF

Save the machine language routine with the name SPAN.ML before you exit *MLX*. Now format a blank disk and place *Spanish Vocabulary Quiz* on it. Use this disk to store the word files you create.

Options

The options menu contains five choices: 1. English Words 2. Palabras de Español 3. Load a Word File 4. File Options 5. Quit

The first two options quiz you on English or Spanish words, respectively. If there is no word file in memory, you'll automatically be taken to option 3.

To load a file, enter its name at the

prompt and press Return. To see a list of files on the disk, type a dollar sign (\$) and press Return. When a file has been loaded, you'll be given a set of simple instructions. Press Return to begin the quiz.

You'll be given a word in English (or Spanish) and asked to translate it. Type your answer at the prompt and press Return. If you make a mistake, use the Inst/Del key to delete a character or press Shift-Ctrl/Home to erase the whole word and start over. To enter accented letters such as á, é, í, ó, or ú, hold down the Commodore key and type the letter. Likewise, to get the tilde (ñ) character, hold down the Commodore key and press N. To write an upside-down exclamation point (!), press the Back Arrow key. Make an upside-down question mark (?) by pressing the slash (/) character.

You're given three chances to guess the word. After three incorrect guesses, the program provides the answer. If you wish to see the answer before making three guesses, type a question mark at the prompt and press Return. To exit the quiz before all the words are asked, enter an asterisk at the prompt and press Return.

Scoring

After the quiz you'll be given the number of words you identified correctly and your percentage of correct answers. Your score depends not only on how many words you answered correctly but also on how many guesses it took you. Every incorrect answer will decrease your score. For example, in order to obtain a perfect score of 100 percent, you must answer every question correctly on the first try. A good way to study is by going through the same list repeatedly until you can score 100 percent.

File Options

The menu of file options offers several choices.

1. Create a Word File
2. Append to a Word File
3. Edit a Word File
4. Return to Main Menu

Create a file when starting a new word list. First, enter the name of the file.

Next, enter the English word and then the Spanish form. You'll then have a chance to make any corrections, enter more words, or stop.

Select Append to add words to the current list in memory. It's a good idea to limit your list to 20 words or less.

Edit a Word File lets you make corrections to the current word file. The first word in the list will be displayed in English and Spanish. Press E to edit the word. When editing, move the flashing cursor over the English word, make your changes, and then press Return. Do the same for the Spanish word. To move on to the next word, press C to continue. The program will display the next word in the list. When you've finished editing, press Q to quit to the options menu and save any changes you've made.

Spanish Vocabulary Quiz

```

XE 0 REM COPYRIGHT 1991 - COMP
    UTE PUBLICATIONS INTL LTD
    - ALL RIGHTS RESERVED
RH 10 REM SPANISH VOCABULARY Q
    UIZ V1.2
RC 20 REM{8 SPACES}BY CHRIS ST
    OY
SF 30 :
EP 40 GOTO 2200:REM SETUP
SC 100 T=0:PRINT "{HOME}{BLK}"A
    N$"{5 DOWN}":POKE 49153
    ,5:POKE 49157,5
RX 105 PRINT "{6}"AWS:SPC(20-LE
    N(AWS))"{WHT}>";LN=17:
    GOSUB 200
GB 110 ON -(WDS="?")-2*(WDS="*
    ") GOTO 145,700
MQ 115 SYS 49152
KH 116 LC=LEN(ANS):IF LEN(WDS)
    >LEN(ANS) THEN LC=LEN(W
    D$)
KH 117 PC=INT(PEEK(49212)*100/
    LC)-INT(PEEK(49213)/2)
DP 120 IF PC>70 THEN PRINT"
    {DOWN}{WHT}<MUY BIEN! C
    ORRECT!":SC=SC+ABS(T-3)
    :C=C+1:GOTO145
PB 125 T=T+1:IF T=3 THEN 145
DM 126 IF T=1 THEN POKE 49157,
    245
XH 127 IF T=2 THEN POKE 49153,
    6:POKE 49157,229
JX 130 IF PC>30 THEN PRINT"
    {DOWN}{1} ALMOST. TRY A
    GAIN.{DOWN}":GOTO 140
PE 135 PRINT "{DOWN}{2} SORRY,
    {SPACE}WRONG. TRY AGAIN
    .{DOWN}"
XP 140 GOSUB 410:GOTO105
BX 145 W=W+1:RN%(I)=1:PRINT"
```


PROGRAMS

```

{6}{DOWN}THE ANSWER IS
{SPACE}{WHT}"ANS"{6}."
GOSUB 1000:IF W=X THEN
{SPACE}700
SX 150 FL=1:GOTO 400
GX 200 WDS="":POKE 198,0:PRINT
"<";
DF 205 GET KE$:IF KE$="" THEN
{SPACE}205
XK 206 POKE54296,15:POKE54296,
0
HQ 210 IF KE$=CHR$(13) THEN PR
INT:RETURN
ED 215 IF KE$=CHR$(17) OR KE$=
CHR$(19) OR KE$=CHR$(14
5) THEN 205
FA 217 IF KE$=CHR$(147) THEN F
OR ZZ=0 TO LEN(WDS):PRI
NTCHR$(20);:NEXT:GOTO 2
00
GC 220 IF KE$<>CHR$(20) THEN 2
35
HF 225 IF LEN(WDS)=0 THEN 205
AC 230 WDS=LEFT$(WDS,LEN(WDS)-
1):PRINT"{2 LEFT}<
{LEFT}";:GOTO 205
PJ 235 IF LEN(WDS)>LN THEN 205
KR 240 WDS=WDS+KE$:PRINT
{LEFT}"KE$"<";
GE 245 GOTO 205
GM 300 IF X<1 THEN 1300
BP 315 PRINT"{CLR}{WHT}{DOWN}"
TAB(11)"QUIZ "QT$ "WORD
S"
DX 320 PRINTTAB(11)"{1}{18 T}"
HH 325 PRINT"{2 DOWN}{6}
{2 SPACES}I WILL GIVE Y
OU A WORD IN {WHT}"QT$ "
{6},"
HD 330 PRINT"{DOWN} THEN I WIL
L ASK YOU TO ENTER THE
{SPACE}WORD":PRINT
{DOWN} IN {WHT}"OT$"{6}
."
JM 335 PRINT"{2 DOWN}{WHT}EXAM
PLE:"PRINT"{DOWN}"QT$;
SPC(13);OTS
GG 340 PRINT"{3}{7 T}"SPC(13)"
{7 T}":PRINT"{6}"EQ$:PR
INT"{UP}"TAB(20);EOS:GO
SUB 1000
XH 345 FOR Z=1 TO X:RN%(Z)=0:N
EXT:W=0:SC=0:C=0
XF 400 I=INT(X*RND(0))+1:IF RN
%(I)=1 THEN400
CF 405 PRINT"{CLR}{DOWN}{YEL}T
YPE YOUR ANSWER, THEN H
IT [{WHT}RETURN{YEL}].
{2 DOWN}"
SF 410 PRINT"{WHT}"QT$;SPC(13)
;OTS:PRINT"{3}{7 T}"SPC
(13)"{7 T}":RETURN
HD 500 QT$="ENGLISH":OTS="SPAN
ISH":EQ$="THE WORD":EOS
="LA PALABRA"
PG 505 GOSUB 300:IF X=0 THEN 2
100
QX 510 AW$=EN$(I):AN$=SP$(I):G
OSUB 100:IF FL THEN 510
BB 513 IF F=1 THEN 500
PC 515 GOTO 2100
HK 600 OT$="ENGLISH":QT$="SPAN
ISH":EOS="THE WORD":EQ$
="LA PALABRA"
SQ 605 GOSUB 300:IF X=0 THEN 2
100
CX 610 AN$=EN$(I):AW$=SP$(I):G
OSUB 100:IF FL THEN 610
XK 613 IF F=1 THEN 600
SJ 615 GOTO 2100
DX 700 FL=0:IF W=0 THEN F=0:RE
TURN
GR 703 PRINT"{CLR}{11 DOWN}
{WHT}"TAB(12)"CONGATULA
TIONS!!"
JM 705 PRINT TAB(9)"{DOWN}{6}Y
OU COMPLETED THE LIST."
GR 710 FOR Z=1TO192:POKE53280,
Z:NEXT:FORZ=1TO8:PRINT
{DOWN}":NEXT:PRINT
{HOME}{9 DOWN}"
GJ 715 PRINT"{3 SPACES}{YEL}YO
UR SCORE:{WHT} ";INT(SC
/(3*W)*100);"%
PP 720 PRINT"{DOWN}{3 SPACES}
{YEL}YOU GOT{WHT}"C"
{YEL}CORRECT OUT OF
{WHT}"W"{YEL}{LEFT}."
KQ 730 PRINT"{2 DOWN}
{4 SPACES}{6}WOULD YOU
{SPACE}LIKE TO TRY THIS
LIST"
RK 740 PRINT"{DOWN}{4 SPACES}A
GAIN ({WHT}Y{6} OR
{WHT}N{6})?{WHT} ";
CS 750 GET KE$:IF KE$="" THEN
{SPACE}750
JA 755 IF KE$="Y" THEN PRINT"Y
":F=1:RETURN
KK 760 IF KE$<>"N" THEN 750
HM 765 PRINT"N":F=0:RETURN
RF 1000 PRINTTAB(7)"{2 DOWN}
{YEL}PRESS [{WHT}RETUR
N{YEL}] TO CONTINUE.":
POKE 198,0
FM 1005 GET KE$:IF KE$<>CHR$(1
3) THEN 1005
DS 1010 RETURN
XP 1100 POKE 53272,21:POKE 532
80,14:POKE 53281,6:PRI
NT"{7}{CLR}":END
AJ 1200 INPUT#15,ER,ERS,DT,DS:
FL=0
JC 1205 IF ER=62 THEN PRINT"
{CLR}{RED}{9 DOWN}"TAB
(13)"FILE NOT FOUND.":
FL=1:RETURN
FB 1210 IF ER>19 THEN PRINT"
{RED}{2 DOWN}DISK ERRO
R # "ER;ERS"{8 DOWN}":F
L=1
BQ 1215 RETURN
RP 1300 PRINT"{CLR}{WHT}{DOWN}
{TAB(12)"LOAD A WORD F
ILE"
XJ 1315 PRINTTAB(12)"{3}{16 T}
"
PF 1320 PRINT"{2 DOWN}{6}
{4 SPACES}ENTER NAME O
F FILE AT THE PROMPT."
QM 1325 PRINT"{DOWN}{3 SPACES}
TYPE [{WHT}{6}] TO VI
EW DIRECTORY."
FC 1330 PRINT"{DOWN}{3 SPACES}
PRESS [{WHT}RETURN{6}]
ALONE TO RETURN TO"
RC 1335 PRINT"{DOWN}{3 SPACES}
{WHT}OPTIONS {6}MENU."
RP 1340 PRINT:PRINT"{2 DOWN}
{7}NAME OF FILE:{WHT}>
";:LN=15:GOSUB 200
FX 1345 IF WDS="" THEN 2100
QJ 1350 IF WDS="$" THEN 1410
GF 1360 FL$=WDS:OPEN15,8,15:OP
EN2,8,2,"0:"FL$+"",S,R
"
PA 1365 GOSUB 1200:IF FL=1 THE
N CLOSE2:CLOSE15:GOSUB
1000:GOTO 2100
JJ 1390 INPUT#2,X:FOR S=1 TO X
:INPUT#2,EN$(S),SP$(S)
:NEXT
CQ 1400 CLOSE2:CLOSE15:GOTO 21
00
FP 1410 PRINT"{CLR}{6}PRESS [
{WHT}SHIFT{6}] TO PAUS
E.":SYS 49250:PRINT:GO
SUB 1000:GOTO 1300
BB 1600 PRINT"{CLR}{WHT}{DOWN}
{TAB(11)"WORD FILE OPT
IONS":PRINTTAB(11)"{3}
{17 T}"
MQ 1605 PRINTTAB(16)"{DOWN}{6}
OPTIONS":PRINTTAB(16)"
{2}{7 T}"
GX 1610 PRINTTAB(8)"{DOWN}
{WHT}1. CREATE A FILE"
:PRINTTAB(8)"{DOWN}2.
{SPACE}APPEND TO A FIL
E"
AB 1615 PRINTTAB(8)"{DOWN}3. E
DIT A FILE"
CD 1620 PRINTTAB(8)"{DOWN}4. R
ETURN TO {WHT}MAIN MEN
U{2 DOWN}"
BK 1630 PRINT"{6}{6 SPACES}ENT
ER YOUR CHOICE{WHT}:
{4 SPACES}{3 LEFT}";
GJ 1635 GET KE$:IF KE$<"1" OR
{SPACE}KE$>"5" THEN 16
35
SS 1640 PRINT KE$:ON VAL(KE$)
{SPACE}GOTO 1700,1700,
1800,2100
XA 1698 REM CREATE/APPEND A FI
LE
RE 1700 KE=VAL(KE$):IF KE=2 AN
D X=0 THEN 1300
QE 1705 PRINT"{CLR}{WHT}{DOWN}
{TAB(12)"MAKE A WORD F
ILE":PRINTTAB(12)"{3}
{16 T}"
JX 1707 IF KE=2 THEN 1720
FB 1710 PRINT"{DOWN}{4 SPACES}

```



```

        {6}NAME OF FILE{WHT}:"
        ;:LN=15:GOSUB 200:IF W
        D$="" THEN 2100
ES 1715 FL$=WD$+LEFT$(NL$,16-L
        EN(WD$)):F=F+1:F$(F)=F
        L$:X=X+1:KE=2:GOTO 1705
HX 1720 X=X+1:PRINT"HOME"
        {4 DOWN}"TAB(10)"{YEL}
        FILE:{WHT}";FL$
KX 1725 PRINTTAB(7)"DOWN"
        {YEL}NUMBER OF WORDS S
        O FAR{WHT}:"";X-1
JQ 1730 PRINT"6}{2 DOWN}
        {4 SPACES}FIRST, ENTER
        THE {WHT}ENGLISH{6} W
        ORD AT"
RE 1735 PRINT"3 SPACES}THE PR
        OMPT, THEN ENTER THE
        {WHT}SPANISH."
RK 1740 PRINT"DOWN}{8} ENGLIS
        H WORD: {WHT}";:LN=17:
        GOSUB 200:EN$(X)=WD$:I
        F WD$="" THEN 1763
KQ 1745 PRINT"2 DOWN}{8} SPAN
        ISH WORD: {WHT}";:LN=1
        7:GOSUB 200:SP$(X)=WD$:
        IF WD$="" THEN 1763
BF 1750 PRINT"2 DOWN}{YEL} IS
        THIS CORRECT ({WHT}Y
        {YEL} OR {WHT}N{YEL})?
        {WHT} ";
QJ 1755 GET KE$:IF KE$="N" THE
        N PRINT"N":GOTO 1705
PX 1760 IF KE$<"Y" THEN 1755
SR 1763 IF WD$="" THEN PRINT"
        {BLK}";X=X-1
FD 1765 PRINT"Y":PRINT"RIGHT"
        {YEL}{DOWN}ENTER ANOTH
        ER WORD ({WHT}Y{YEL} O
        R {WHT}N{YEL})?{WHT} "
        ;
PH 1770 GET KE$:IF KE$="Y" THE
        N PRINT"Y":GOTO 1705
SE 1775 IF KE$<"N" THEN 1770
PC 1780 PRINT"N":OPEN15,8,15:I
        F KE=2 THEN PRINT#15,"
        S0:"+FL$:GOSUB 1200
HJ 1785 IF FL THEN CLOSE 15:GO
        SUB 1000:GOTO 2100
RM 1790 OPEN2,8,2,"0:"+FL$+"S
        ,W":GOSUB 1200:IF FL T
        HEN CLOSE 2:GOTO 1785
XD 1791 PRINT#2,X:FOR S=1 TO X
        :PRINT#2,EN$(S):PRINT#
        2,SP$(S):NEXT:GOSUB 12
        00
HE 1792 IF FL THEN CLOSE 2:GOT
        O 1785
QB 1793 PRINT"CLR}{6}{9 DOWN}
        "TAB(14)"FILE SAVED.
        {2 DOWN}"
XA 1794 CLOSE2:CLOSE15:GOSUB10
        00:GOTO 2100
KP 1800 IF X=0 THEN GOSUB 300:
        GOTO 2100
GP 1810 S=1:FL=1:PRINT"CLR"
        {WHT}{DOWN}"TAB(15)"ED
        IT A FILE"
QJ 1815 PRINTTAB(15)"3}{11 T}
        "
QF 1820 PRINT"DOWN}{YEL} FILE
        : {WHT}";FL$:SPC(17-LE
        N(FL$))"{YEL}# OF WORD
        S:{WHT}";X
RP 1825 PRINT"DOWN}{3}{40 Y}"
PA 1830 PRINT"HOME}{8 DOWN}
        {6} ON WORD:{WHT}
        {4 SPACES}{4 LEFT}";S
AH 1835 PRINT"2 DOWN}{8}
        {2 SPACES}ENGLISH WORD
        : {WHT}";EN$(S);LEFT$(
        SC$,22-LEN(EN$(S))):PR
        INT
MS 1840 PRINT"8}{2 SPACES}SPA
        NISH WORD: {WHT}";SP$(
        S);LEFT$(SC$,22-LEN(SP
        $(S))):PRINT
GD 1845 PRINT"2 DOWN}{YEL}[
        {WHT}E{YEL}] TO {WHT}E
        DIT{YEL} WORDS"
MK 1850 PRINT"DOWN}[{WHT}C
        {YEL}] TO {WHT}CONTINU
        E{YEL} LISTING"
QH 1855 PRINT"DOWN}[{WHT}Q
        {YEL}] TO {WHT}QUIT
        {YEL} TO {WHT}OPTIONS
        {YEL} MENU{DOWN}"
GQ 1860 GET KE$:IF KE$="" THEN
        1860
RK 1865 ON -(KE$="E")-2*(KE$="
        C")-3*(KE$="Q")GOTO189
        0,1870,1880:GOTO1860
PM 1870 S=S+1:IF S < (X+1) THE
        N1830
JD 1875 S=1:GOTO1830
XA 1880 IF FL THEN 2100
QM 1885 KE=2:PRINT"BLK":GOTO
        1780
DA 1890 PRINT"HOME}{11 DOWN}"
        TAB(16);"{WHT}";:POKE1
        9,65:INPUTTE$:POKE19,0
        :PRINT
HS 1891 PRINT"DOWN}"TAB(16);"
        {WHT}";:POKE19,65:INPU
        TT$:POKE19,0:PRINT
RK 1892 IF TE$<EN$(S) OR TS$<
        >SP$(S) THEN EN$(S)=TE
        $:SP$(S)=TS$:FL=0
BQ 1893 GOTO 1830
RK 2100 PRINT"CLR}{DOWN}"TAB(
        9)"{WHT}SPANISH VOCABU
        LARY QUIZ"
BS 2105 PRINTTAB(9)"3}{23 T}"
PR 2110 PRINTTAB(16)"{DOWN}{6}
        OPTIONS":PRINTTAB(16)"
        {BLU}{7 T}{DOWN}"
ER 2115 PRINTTAB(8)"{WHT}1. EN
        GLISH WORDS":PRINTTAB(
        8)"{DOWN}2. PALABRAS D
        E ESPAÑOL"
RF 2120 PRINTTAB(8)"{DOWN}3. L
        OAD A WORD FILE":PRINT
        TAB(8)"{DOWN}4. FILE O
        PTIONS"
BP 2125 PRINTTAB(8)"{DOWN}5. Q
        UIT"
FS 2130 PRINT"2 DOWN}{6}
        {4 SPACES}ENTER YOUR C
        HOICE{WHT}:"";
FC 2135 GET KE$:IF KE$<"1" OR
        {SPACE}KE$>"5" THEN 21
        35
XX 2140 PRINT KE$:ON VAL(KE$)
        {SPACE}GOTO 500,600,13
        00,1600,1100
XX 2200 POKE53280,0:POKE53281,
        0
QQ 2202 IF LV=1 THEN POKE 56,5
        6:CLR:GOTO 2245
XR 2205 PRINTCHR$(14)"6}{CLR}
        "TAB(9)"2 DOWN}{WHT}S
        PANISH VOCABULARY QUIZ
        "
PP 2210 PRINTTAB(9)"3}{23 T}"
FX 2215 PRINTTAB(12)"{DOWN}{6}
        COPYRIGHT 1991"
BG 2216 PRINTTAB(4)"2 DOWN"
        {WHT}COMPUTE PUBLICATI
        ONS INTL LTD{2 DOWN}"
EM 2220 PRINTTAB(10)"{YEL}ALL
        {SPACE}RIGHTS RESERVED
        "
JM 2230 PRINTTAB(13)"3 DOWN"
        {WHT}PLEASE WAIT..."
GC 2240 IF LV=0 THEN LV=1:LOAD
        "SPAN.ML",8,1
XH 2245 DIM EN$(30),SP$(30),RN
        $(30),F$(120)
DC 2255 POKE 56334,PEEK(56334)
        AND 254:POKE 1,PEEK(1
        ) AND 251:SYS 49217
CD 2265 POKE 1,PEEK(1) OR 4:PO
        KE 56334,PEEK(56334) O
        R 1
SF 2270 READ A:IF A=-1 THEN228
        0
FM 2275 FOR I=0 TO 7:READ B:PO
        KE 14336+A*8+I,B:NEXT:
        GOTO2270
CD 2280 POKE 53272,(PEEK(53272
        )AND 240)OR 14
JC 2285 SC$="{21 SPACES}":GOTO
        2100
PE 2435 DATA 30,36,0,102,102,1
        02,102,62,0
EA 2440 DATA 31,0,24,0,0,24,24
        ,24,24
KX 2445 DATA 47,0,24,0,24,48,9
        6,102,60
BD 2450 DATA 98,6,24,0,56,24,2
        4,60,0
KA 2455 DATA 106,54,72,124,102
        ,102,102,102,0
MF 2460 DATA 112,6,8,60,6,62,1
        02,62,0
QK 2465 DATA 113,6,8,60,102,12
        6,96,60,0
KP 2470 DATA 120,6,8,102,102,1
        02,102,62,0
GA 2475 DATA 121,6,8,60,102,10
        2,102,60,0
EJ 2480 DATA 158,219,255,153,1
        53,153,153,193,255
SG 2485 DATA 159,255,231,255,2

```


PROGRAMS

```
55,231,231,231,231
SP 2490 DATA 175,255,231,255,2
31,207,159,153,195
SA 2495 DATA 226,249,231,255,1
99,231,231,195,255
QE 2500 DATA 234,201,183,131,1
53,153,153,153,255
SB 2505 DATA 240,249,247,195,2
49,193,153,193,255
HJ 2510 DATA 241,249,247,195,1
53,129,159,195,255
FG 2515 DATA 248,249,247,153,1
53,153,153,193,255
BP 2520 DATA 249,249,247,195,1
53,153,153,195,255
GJ 2525 DATA -1
```

SPAN.ML

```
C000:A9 05 85 FC A9 05 85 FB 80
C008:A0 00 8C 3C C0 8C 3D C0 A2
C010:8C 3E C0 AE 3E C0 B1 FB BE
C018:C9 3C D0 01 60 DD 00 04 36
C020:F0 10 CA DD 00 04 F0 07 4E
C028:E8 E8 DD 00 04 D0 06 EE 72
C030:3D C0 EE 3C C0 EE 3E C0 21
C038:C8 4C 13 C0 00 00 00 EA 8A
C040:EA A9 00 85 FB 85 FD A9 95
C048:D8 85 FC A9 38 85 FE A2 4A
C050:08 A0 00 B1 FB 91 FD 88 C3
C058:D0 F9 E6 FC E6 FE CA D0 07
C060:F0 60 A9 01 A2 08 A0 00 2E
C068:20 BA FF A9 02 A2 BC A0 F7
C070:C0 20 BD FF 20 C0 FF A2 B8
C078:01 20 C6 FF 20 CF FF 20 BB
C080:CF FF 20 CF FF 85 FB 20 19
C088:CF FF 05 FB FF 25 A9 0D CE
C090:20 D2 FF AD 8D 02 29 01 79
C098:D0 F9 20 CF FF AA 20 CF BC
C0A0:FF 20 CD BD A9 20 20 D2 A0
C0A8:FF 20 CF FF F0 D4 20 D2 1A
C0B0:FF D0 F6 A9 01 20 C3 FF EF
C0B8:20 CC FF 60 24 30 00 00 65
```

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SPEEDSWAP

By Larry Hagney

Most of us don't use *SpeedScript* to write the Great American Novel. Usually we confine our efforts to smaller endeavors such as letters, reports, term papers, program documentation, and such. As a result much of the text memory available to *SpeedScript* remains empty.

Suppose you're using *SpeedScript* to write a term paper. In the midst of your efforts, you remember a couple of paragraphs in a document that you wrote a couple of months ago and decide they would fit perfectly with this paper.

To incorporate that material takes more than a little effort. First, you save your paper to disk, load in the old document, copy the relevant section into the text buffer, erase the old document, load in the term paper, and then finally insert the saved text in the appropriate area of your paper.

Well, those days are gone forever. With *SpeedSwap* patched into your copy of *SpeedScript* 3.2 for the 64, two text documents can coexist in memory. The problem mentioned above is now simple to solve. Just move to your alternate screen and load the old document. Now both documents are independently accessible. Material can be copied from one document to the other, or one text area can be your workscreen while the second serves as a storage area for various reference materials.

Getting Started

SpeedSwap is a BASIC program which contains a short (227 bytes) machine language routine. To avoid typing errors, enter the program using *The Automatic Proofreader*; see "Typing Aids" elsewhere in this section. When you've finished typing, save a copy of the program to a disk containing *SpeedScript*. Your copy of *SpeedScript* must be saved with the filename *SPEEDSCRIPT* because *SpeedSwap* automatically loads and runs that filename.

When you run *SpeedSwap*, it lets you allocate memory for each of two text areas, identified onscreen as area 0 and area 1. Default sizes of 21,504 and 21,760 bytes are displayed in white text. Pressing *CRSR-down* decreases the size of text area 0 in 256-byte chunks, while increasing text area 1 by a similar amount. *CRSR-up* performs the opposite function. Note that the total number of bytes of both text areas is always 43,264. This is 256 bytes less than *SpeedScript* normally makes available because *SpeedSwap* allocates a 256-byte safety zone between each text area.

If you're not sure how many bytes to allocate for a file that's already on disk, corresponding disk block sizes are also displayed. Once the text areas are adjusted for your needs, press *Return* to boot *SpeedScript*. *SpeedSwap* sets up its machine lan-

guage routine which loads *SpeedScript*, patches itself in, and then runs the word processor.

Only One Command

With *SpeedSwap* patched into *SpeedScript*, you have complete, independent control over two areas of text memory. Only one command is needed to switch between the two. Press the *Ctrl* key and *Commodore* logo key simultaneously to toggle between text area 0 and text area 1.

When *SpeedScript*'s screen first appears, you'll see a 0 in the command line, indicating that you are now working in text area 0. Press the *Ctrl* key and the = key simultaneously to see the amount of memory allotted to this area.

Press *Ctrl-Commodore* to access area 1, indicated by a 1 in the command line. Area 1 provides 43,264 bytes minus the number of bytes in area 0 for text storage.

Each text area is completely independent of the other. Text can be printed from, loaded into, or saved from one area, without disturbing or being affected by the other. You can erase all text in one area while text in the other area remains untouched. Each area also supports its own text and background colors.

In short, every *SpeedScript* command behaves as though the active text area is the only text area. One notable exception is *SpeedScript*'s text buffer; text from one area can be copied into the buffer and inserted into the other text area. Similarly, *HUNT* and *REPLACE* phrases are also portable to each area. One handy *SpeedSwap* feature is cursor positioning. When you return to a text area, you'll find the cursor in the same position as you left it. This is convenient when using one text area for viewing reference materials and the other for writing.

Keep in Mind

The changes *SpeedSwap* makes to *SpeedScript* are not permanent, so load and run *SpeedSwap* whenever you want to use it. There are a few cautions that you should bear in mind, however. Do not attempt to load a document into a text area for which you haven't allocated enough space. For in-

If you plan to exit *SpeedScript* and then return from BASIC, be sure that text area 0 is active when you quit. Otherwise, text could be damaged.

```

DB 10  REM COPYRIGHT 1991 COMPU
      TE PUBLICATIONS INTL LTD
      - ALL RIGHTS RESERVED
GP 20  POKE808,234:PRINT"{CLR}
      {N}{H}{8}";:DIMX,Q$,A,B
      C,S,E,E$:X=121:E$="DATA
      {SHIFT-SPACE}ERROR IN LI
      NES"
AQ 30  S=828:E=934:GOSUB180:IFC
      <>11409THENPRINT$190$-"
      250:STOP
XC 40  SYSS:PRINT"SPEEDSCRIPT 3
      .2 SPEEDSWAP":PRINT"{4}
      {DOWN}COPYRIGHT 1991"
MA 50  PRINT"COMPUTE PUBLICATIONS
      INTL LTD":PRINT"ALL R
      IGHTS RESERVED{DOWN}"
BH 60  S=53000:E=53226:GOSUB180
      :IFC<>25771THENPRINT$26
      0$-"390:SYS906:STOP
GF 70  PRINT"PRESS CRSR UP/DOWN
      TO SELECT SIZE
      {7 SPACES}(IN BYTES) OF
      {SPACE}EACH TEXT AREA."
CM 80  PRINT"PRESS RETURN TO LO
      AD SPEEDSCRIPT."
XG 90  PRINT"PRESS CTRL/C= FROM

```

```

      WITHIN SPEEDSCRIPT
      {3 SPACES}TO SWAP TEXT A
      REAS.{DOWN}"
EQ 100  FORA=:TOL:PRINT"TEXT AR
      EA"ASPC(8)"DISK BLOCKS"
      :NEXT
MS 110  PRINT"TOTAL BYTES 43264
      {3 SPACES}TOTAL BLOCKS
      {SPACE}169{WHT}{UP}"
DF 120  PRINT"{2 UP}"SPC(11-(X<
      77))*X*256-9472SPC(13-(X
      <137)-(X<47))" "X-37
PK 130  PRINTSPC(11-(X>166))529
      92-(X+1)*256SPC(13-(X>1
      06)-(X>196))" "206-X
SP 140  GETQS:ON-(QS="{DOWN}"OR
      QS="{UP}")GOTO170:IFQS<
      >CHR$ (13)THEN140
BP 150  POKE53041,X:X=X+1:POKE5
      3209,X:POKE53218,X:POKE
      53224,X:POKE53226,X
GB 160  SYS906:PRINT"{CLR}{8}LO
      ADING SPEEDSCRIPT..." :P
      OKE808,237:SYSS:END
QC 170  X=X+(QS="{DOWN}")-(QS="
      {UP}") :X=X-162*((X=40)-
      (X=203)):POKE646,-(X=12
      1):GOTO120
GD 180  C=.:FORA=S TOE:READB:PO
      KEA,B:C=C+B:NEXT:RETURN
AR 190  DATA120,169,0,141,14,22
      0,169,27,141,17,208,169
      ,91,141,20,3,169
DM 200  DATA3,141,21,3,169,1,14
      1,26,208,141,18,208,88,
      96,169,58,172
MG 210  DATA135,3,205,18,208,20
      8,8,169,1,172,136,3,140
      ,32,208,140,33
PG 220  DATA208,141,18,208,201,
      1,240,8,169,1,141,25,20
      8,76,188,254,169
BM 230  DATA0,141,25,208,76,49,
      234,0,12,0,120,169,0,14
      1,26,208,141
BG 240  DATA32,208,141,33,208,1
      69,49,141,20,3,169,234,
      141,21,3,169,1
SQ 250  DATA141,14,220,88,96
BX 260  DATA169,5,162,8,168,32,
      186,255,169,11,162,205,
      160,207,32,189,255
MA 270  DATA169,0,133,10,141,8,
      32,32,213,255,169,76,16
      2,207,141,134,10
EB 280  DATA142,135,10,142,11,3
      2,169,121,141,177,9,169
      ,37,141,9,32,173
MF 290  DATA29,13,141,235,207,1
      73,44,13,141,236,207,32
      ,55,9,76,13,8
JE 300  DATA162,49,142,38,216,1
      73,11,32,201,207,240,1,
      202,142,38,4,173
CF 310  DATA141,2,201,6,208,103
      ,165,2,160,0,145,57,132
      ,162,165,162,41
DB 320  DATA16,240,250,162,3,1

```

Have your monthly credit card statement and any late purchase receipts on hand when you run *Credit Control*. When you first use the program or if your financial situation later changes, move the highlight cursor to the Statistics menu option and press Return. A series of prompts will guide you. Simply enter your card's finance charge

PROGRAMS

rate, your monthly payment date, your self-imposed monthly credit purchase limits, and your credit limit. After you make these entries, you'll return to the main menu.

To record your credit transactions, select the Data Entry option. You'll be asked to enter the month and day of each transaction and the seller's name and description of items purchased. (Keep the name and description to 13 characters or less.) For your first entry, enter the date and balance due from your last monthly credit statement. Then enter any credit purchases or payments made since the statement date.

At the end of each transaction, you'll be given several options. You may enter another transaction, make changes to previous entries, return to the main menu, or display your current entries. After you've entered all of your credit card transactions, return to the menu and select the Storage option to save your data. You may want to save the data with a name that is similar to your credit card's. Use any valid filename up to 12 characters in length. *Credit Control* appends a prefix of CDF to each filename for easy identification, but omit these letters when loading the data back into your program.

Taking Control

After you charge an item or make a payment on your account, load your file from the Storage option, select Data Entry, and then enter the transaction. If you make a payment, place a minus sign immediately before any payment amounts or returns. These will appear as subtractions from the account balance. Save the file when data entry is complete. *Credit Control* takes care of everything else.

On the menu screen you'll be informed of your credit card balance. You'll also receive some friendly advice on credit management, if necessary. A listing of transactions and balances can be made at any time. Error corrections can be made easily for the last two entries. Earlier errors can be rectified by making a new entry that adds or subtracts the proper amount to correct the balance.

Each credit card's account can be maintained in a separate file. However,

if you begin the system with a realistic self-imposed monthly spending limit, *Credit Control* will advise you when to get rid of those extra cards. Also, be aware that you don't have to accept the card company's suggested monthly payment amount. *Credit Control* will advise you on payment size and other factors, too.

Keep all your credit slips handy in an envelope or simple file. Then get into the habit of regularly entering them. Follow the program's financial advice, enjoy *Credit Control*, and don't abuse your credit with overuse.

CREDIT CONTROL

```

XE 0 REM COPYRIGHT 1991 - COMP
    UTE PUBLICATIONS INTL LTD
    - ALL RIGHTS RESERVED
EX 10 REM CREDIT CONTROL -BY G
    . REID. CC
KC 20 MX=61:X=0:L=1:OS="10.5":
    PS="10TH OF MONTH":M=10:
    CL=1000
AK 30 DIM DS(MX,4)
AA 40 PRINT "{CLR}"
AJ 50 FORXX=1TO5:PRINT "{DOWN}"
    :NEXT:GOSUB980
MR 60 PRINT "{HOME} {2 DOWN}";TA
    B(13) "{GRN}CREDIT
    {SHIFT-SPACE}CONTROL{7}"
CX 70 PRINTTAB(13) "*****"
CP 80 PRINT CHR$(14)
BP 90 SYS$="{RVS}{CYN}":SZ$="
    {OFF}{7}"
GE 100 NS(1)="DATA ENTRY":NS(2)
    ="DISPLAY"
AS 110 NS(3)="STORAGE":NS(4)="
    STATISTICS"
SM 120 NS(5)="EXIT"
ER 130 FOR C=1TO5:PRINTTAB(13)
    NS(C):NEXT
GK 140 PRINT "{6 UP}":C=1:PRINT
    TAB(13)SYNS(1)SZ$
XD 150 GETGS:IFGS$=""THEN150
KR 160 IFGS$=CHR$(13)THEN200
CE 170 IFGS$="{DOWN}"THEN PRINT
    "{UP}";TAB(13)NS(C):C=C
    +1:PRINTTAB(13)SYNS(C)
    SZ$
MK 180 IFC=6THENPRINT "{UP}";:G
    OTOL40
DX 190 GOTO150
AE 200 ON C GOTO330,570,730,21
    0,1240
AQ 210 PRINT "{CLR} {2 DOWN}STAT
    ISTICAL DATA ENTRY":PRI
    NT
QE 220 PRINT"ENTER YOUR NEW:-"
XS 230 PRINT "{DOWN}ANNUAL FINA
    NCE CHARGE RATE"
GA 240 PRINT"CURRENT IS--";OS:

```

```

INPUT OS:IFVAL(OS)<1THE
N210
FS 250 PRINT "{DOWN}MONTHLY PAY
    MENT DATE"
AX 260 PRINT"CURRENT IS--";PS:
    INPUT PS
CP 270 PRINT "{DOWN}BUDGETED MA
    XIMUM MONTHLY CREDIT"
AQ 280 PRINT"PURCHASES AMOUNT
    {SPACE}$"
FA 290 PRINT"CURRENT IS--";M:I
    NPUT M:IFM<1THEN270
SJ 300 PRINT "{DOWN}ASSIGNED CR
    EDIT LIMIT"
FF 310 PRINT"CURRENT IS--";CL:
    INPUT CL
DH 320 GOTO40
GQ 330 X=X+1:Y=0:IS$="--":IFX>M
    X-1THENPRINT "{CLR}
    {DOWN}FULL FILE":X=L:GO
    TO430
DE 340 PRINT "{CLR} {2 DOWN}ENTE
    R MONTH & DAY OF PURCHA
    SE":GOSUB420
HQ 350 PRINT "{CLR} {2 DOWN}ENTE
    R SELLER'S NAME/DESCRIP
    TION":GOSUB420
BD 360 PRINT "{CLR} {2 DOWN}ENTE
    R AMOUNT (CHARGED OR PA
    ID) $"
QE 370 PRINT"(PAYMENT MUST BE
    {SPACE}MINUS E.G.
    {2 SPACES}-56){DOWN}":L
    =X:GOSUB420
XQ 380 B2=B2+VAL(D$(X,3)):B2=I
    NT(B2*100+.5)/100:D$(X,
    4)=STR$(B2)
HX 390 IFVAL(D$(X,3))<0THENB4=
    B3:B3=B2
RS 400 IFX=LTHEN430
BD 410 X=X+1:GOTO520
DR 420 INPUTIS:Y=Y+1:D$(X,Y)=I
    S:IS$="--":RETURN
RG 430 PRINT "{DOWN} E=ENTER: C
    =CHANGES: M=MENU: D=DIS
    PLAY"
CB 440 GET NS:IFNS$=""THEN440
SE 450 IF NS$="E"THEN330
FG 460 IF NS$="C"THEN500
MG 470 IF NS$="M"THEN400
QQ 480 IF NS$="D"THEN570
DD 490 GOTO440
BA 500 PRINT "{CLR} {DOWN}HIT RE
    TURN AFTER CHANGES OR T
    O BY-PASS{2 SPACES}AN E
    NTRY"
JC 510 X=X-1:IFX<1THENX=1
JS 520 PRINT "{DOWN}ENTER NEW D
    ATA AT CURSOR:-"
EB 530 B2=VAL(D$(X-1,4)):PRINT
QE 540 PRINT"#";X:TAB(5)"DATE:
    {3 SPACES}";D$(X,1):IN
    PUT D$(X,1)
XF 550 PRINTTAB(5)"SELLER: ";L
    EFT$(D$(X,2),13):INPUT
    D$(X,2)
KA 560 PRINTTAB(5)"AMOUNT: ";D
    $(X,3):INPUT D$(X,3):P

```



```

RINT:GOTO380
HJ 570 G=1:C2=18:C1=C2
CH 580 PRINT"{CLR}{DOWN}";C$=P
RINT" NO DATE{2 SPACES}
SELLER/DETAIL{2 SPACES}
AMOUNT BALANCE"
AA 590 PRINT" -- ----
{2 SPACES}-----
{2 SPACES}-----
--"
SK 600 FOR C=GTO L
DM 610 PRINTC;TAB(4)LEFT$(D$(C
,1),6);TAB(10)LEFT$(D$(C
,2),13);
FE 620 PRINTTAB(23);F$=D$(C,3
)
BC 630 GOSUB640:F$=D$(C,4):GOS
UB640:PRINT:GOTO680
HF 640 F$="{5 SPACES}" + F$:F$=
RIGHT$(F$,3):IFLEFT$(F$,
1)=". "THEN670
XP 650 IFMID$(F$,2,1)=". "THEN
F$=F$+"0":GOTO670
CH 660 F$=F$+"00"
MM 670 PRINTRIGHT$(F$,8);:RETU
RN
MQ 680 IF C<C1THEN720
HG 690 PRINT"{DOWN}RETURN"
ME 700 GET PA$:IFPA$=""THEN700
DB 710 C1=C1+C2
MP 720 NEXT:PRINT:GOTO430
JS 730 PRINT"{CLR}{2 DOWN}":IN
PUT"ENTER FILE-NAME";C$
QD 740 PRINT" L=LOAD:
{2 SPACES}S=SAVE"
MR 750 GET X$:IFX$=""THEN750
MH 760 IFX$="L"THEN900
AF 770 IFX$<>"S"THEN750
AQ 780 PRINT"WISH TO {YEL}SAVE
{7} ";C$;" ? Y/N"
DG 790 GETX$:IFX$=""THEN790
MP 800 IFX$<>"Y"THEN40
CP 810 OPEN 1,8,2,"@0:CDF"+C$+
",S,W"
GS 820 Q$=CHR$(13)
CM 830 PRINT#1,P$Q$O$Q$M,Q$Q$,Q
$CL
JF 840 C=1:Y=1
CX 850 IF C>LTHEN890
HR 860 A$=D$(C,Y):PRINT#1,A$:Y
=Y+1
GG 870 IF Y>4THEN Y=1:C=C+1
RX 880 GOTO850
DH 890 CLOSE 1:PRINT"{CLR}
{DOWN}SAVED "C$:GOTO50
HS 900 OPEN 1,8,2,"@0:CDF"+C$+"
,S,R"
PK 910 INPUT# 1,P$,O$,M,L,CL
FJ 920 C=1:Y=1
DD 930 IF C>LTHEN970
BS 940 INPUT#1,A$:D$(C,Y)=A$:Y
=Y+1
PK 950 IF Y>4THEN Y=1:C=C+1
BC 960 GOTO930
JG 970 CLOSE 1:X=L:B2=VAL(D$(C
-1,4)):GOTO570
ME 980 U=VAL(D$(X,4))
MG 990 UM=INT((U-M)*100+.5)/10

```

```

0
XG 1000 PRINT:PRINT"{YEL}SELEC
T{7} WITH CURSOR AND R
ETURN"
KQ 1010 PRINT"{2 DOWN}";TAB(10
)"-----"
GC 1020 PRINT"{GRN}YOUR CURREN
T BALANCE IS $";
BR 1030 IFU>MTHENPRINT"{3}"U"
{7}":GOTO1050
BC 1040 PRINTU:IFU=<0THENPRINT
" CONGRATULATIONS!":GO
TO1230
PH 1050 IF(CL-U)<CL*.2 THEN PR
INT" YOUR CREDIT LIMIT
IS $";CL
AD 1060 IFVAL(D$(X,3))<0THEN10
90
HD 1070 PRINT" TO AVOID FINANC
E CHARGE AT ";O$;"% AP
R,"
JA 1080 PRINT" PLEASE PAY BY "
;P$;"{7}"
FA 1090 IFU=<M THEN1230
DD 1100 PRINT"{1}BALANCE EXCEE
DS $";STR$(M);"-BUDGET
BY";UM
RF 1110 R=VAL(O$)/12/100:IF(U/
M*)>.99999THEN1210
MF 1120 N=LOG(1/(1-(U/M*))) /L
OG(1+R)
QE 1130 PRINT" IF NO FURTHER P
URCHASES, IT TAKES"
HE 1140 PRINTINT(N*10+.5)/10;"
MONTHS TO PAY OFF.{7}"
KD 1150 IF N<1.15THEN1230
JK 1160 IF VAL(D$(X,3))<(.25*M
)THEN IF U<B4THENPRINT
" GOOD TREND...BUT"
FQ 1170 IF N>2 THEN1220
KQ 1180 PRINT"{3}INCREASE YOUR
BUDGET TO $";INT(M*N)
;
PQ 1190 IF N<1.5THEN1230
BA 1200 PRINT" OR":GOTO1220
KD 1210 PRINT"{3} CANNOT BE RE
PAID.{2 SPACES}BUDGET
{SPACE}OF $";M;"IS
{4 SPACES}VERY LOW.
{2 SPACES}REPEAT!"
AK 1220 PRINT"{YEL}HIDE
{SHIFT-SPACE}YOUR
{SHIFT-SPACE}CARD AWAY
!{7}"
CQ 1230 RETURN
AG 1240 PRINT"{2 DOWN}DID YOU
{SPACE}SAVE YOUR DATA?
{3 SPACES}Y/N"
JG 1250 GETS$:IF S$=""THEN1250
MA 1260 IF S$="Y"THEN PRINT"
{CLR}":END
HP 1270 GOTO40

```

PLOTTER

By Daniel Lightner

Have you ever designed a screen on the 64 that you would like to use in a program that you're writing? Poking those character values into the proper screen memory locations is a fast and efficient way to do it, but determining those poke values is another story. *Plotter* is just the utility to help you determine those values.

Typing It In

Plotter is written entirely in machine language. To enter it, use *MLX*, our machine language entry program; see "Typing Aids" elsewhere in this section. When *MLX* prompts, respond with the following values.

Starting address: C000

Ending address: C207

Be sure to save a copy of the program before you exit *MLX*.

Putting It to Work

To use the program, enter *LOAD*"PLOT-TER",8,1 and then press Return. When it has finished loading, don't run it. Instead, type *NEW*, press Return, and then enter *SYS49152*. If all has gone well, the program will announce its presence.

To see how *Plotter* works, place the cursor on any character, anywhere on the screen. Press f1. Two numbers should appear in the upper left corner of the screen. The first number is the screen location of the cursor, and the number following the comma is the poke value of the character stored at that location.

If you load *Plotter* from the 64's opening screen and go through the preceding steps, you should see that *Plotter* has been enabled and the word *READY* should be near the bottom of the screen. Place your cursor over the letter *R* in the word *READY* and press f1. At the top of the screen, you may see 1904,18. If your cursor isn't on line 24, you may get a different first number, but you should get an 18, which is the value to poke to the screen to print an *R*.

Now press the space bar to delete the letter *R*. Move the cursor to any

George R. Reid is a professor of business. He lives in Savannah, Georgia, and has excellent credit. □

blank line on the screen, enter POKE 1904,18, and press Return. (Use the numbers at the top of your screen if they are different.) The R should now be back in the word *READY*. Press f7 to clear those values; then move the cursor to another location and press f1 again.

How Does It Do That?

Plotter wedges itself into the 64's hardware interrupt routine and then turns control of the 64 back to the BASIC editor. The program waits in the background, quietly scanning the keyboard for f1 to be pressed. When it detects f1, it copies the characters and colors from the first eight bytes of screen memory. *Plotter* writes the screen location of the cursor and the value of the character under the cursor to the top left corner of the screen. It then scans f7 for a keypress. When the program detects that the f7 key has been pressed, *Plotter* replaces the characters at the top of the screen that may have been overwritten.

You can disable *Plotter* by pressing Run/Stop and the Restore key simultaneously. It would be good practice to disable *Plotter* before using the disk drive. You can activate it again with SYS49152.

PLOTTER

```
C000:A0 00 B9 B0 C1 20 D2 FF 48
C008:C8 C0 54 D0 F5 AD 14 03 47
C010:8D 11 03 AD 15 03 8D 12 B9
C018:03 78 A9 2B 8D 14 03 A9 8D
C020:C0 8D 15 03 58 A9 00 8D 2F
C028:20 CB 60 AE 20 CB E0 00 95
C030:D0 16 A6 CB E0 04 F0 03 2D
C038:6C 11 03 A2 01 8E 20 CB 0D
C040:A5 CE 8D 36 CB 6C 11 03 92
C048:A5 CF C9 01 F0 13 AE 20 2B
C050:CB E0 01 F0 12 E0 02 F0 28
C058:14 E0 04 F0 07 E0 03 F0 5E
C060:09 6C 11 03 4C 34 C1 4C D6
C068:D4 C0 4C 88 C1 A9 03 8D DE
C070:20 CB A5 D1 85 FB A5 D2 01
C078:85 FC 18 A5 D3 65 FB 85 0B
C080:FB A9 00 65 FC 85 FC A5 5E
C088:FC A6 FB 8D 34 CB 8E 33 AB
C090:CB A2 09 8E 35 CB A0 B0 75
C098:AD 33 CB DD A5 C1 AD 34 D8
C0A0:CB FD A6 C1 90 0F 8D 34 88
C0A8:CB AD 33 CB FD A5 C1 8D 36
C0B0:33 CB C8 D0 E3 98 CA F0 EC
C0B8:10 C9 B0 F0 03 8D 35 CB 5E
C0C0:2C 35 CB 30 04 A9 00 F0 D9
C0C8:05 29 7F 20 7B C1 CA 10 91
C0D0:C5 6C 11 03 A9 02 8D 20 33
C0D8:CB A0 00 A9 00 85 FB A9 BA
```

```
C0E0:04 85 FC A9 21 85 FD A9 C4
C0E8:CB 85 FE B1 FB 91 FD C8 97
C0F0:C0 08 D0 F7 A0 00 A9 00 C6
C0F8:85 FB A9 D8 85 FC A9 29 9B
C100:85 FD A9 CB 85 FE B1 FB 3F
C108:91 FD C8 C0 08 D0 F7 A9 16
C110:03 8D 00 D8 8D 01 D8 8D B5
C118:02 D8 8D 03 D8 8D 04 D8 92
C120:8D 05 D8 8D 06 D8 8D 07 55
C128:D8 A2 04 86 FE A2 00 86 B2
C130:FD 6C 11 03 A5 CB C9 03 13
C138:F0 03 6C 11 03 A9 00 8D DF
C140:20 CB A0 00 A9 00 85 FB 2F
C148:A9 04 85 FC A9 21 85 FD FC
C150:A9 CB 85 FE B1 FD 91 FB E0
C158:C8 C0 08 D0 F7 A0 00 A9 6A
C160:00 85 FB A9 D8 85 FC A9 DF
C168:29 85 FD A9 CB 85 FE B1 60
C170:FD 91 FB C8 C0 08 D0 F7 23
C178:6C 11 03 8C 31 CB A0 00 99
C180:91 FD E6 FD AC 31 CB 60 2B
C188:A9 20 8D 06 04 8D 07 04 63
C190:A9 2C 20 7B C1 AD 36 CB AC
C198:85 FB A9 00 85 FC A9 04 8A
C1A0:8D 20 CB 4C 87 C0 01 00 72
C1A8:0A 00 64 00 E8 03 10 27 58
C1B0:0D 0D 9A 43 4F 50 59 52 46
C1B8:49 47 48 54 20 31 39 39 72
C1C0:31 0D 43 4F 4D 50 55 54 28
C1C8:45 20 50 55 42 4C 49 43 6F
C1D0:41 54 49 4F 4E 53 20 49 71
C1D8:4E 54 4C 20 4C 54 44 0D 6D
C1E0:41 4C 4C 20 52 49 47 48 32
C1E8:54 53 20 52 45 53 45 52 E8
C1F0:56 45 44 0D 0D 50 4C 4F DB
C1F8:54 54 45 52 20 45 4E 41 7D
C200:42 4C 45 44 00 00 00 00 A6
```

Daniel Lightner lives in Sidney, Montana. He is the author of *Noah's Arc*, which was published in July 1991. □

SHOWDOWN

By Arihant Jain

Some games are very simple to play, but difficult to master. *Showdown* is such a game.

This board game for one or two players resembles Chinese checkers. The board has 32 pegs arranged in a cross-shaped grid, with one open position in the center. The object is to clear the board of as many pegs as possible. You remove a peg by jumping it with an adjacent peg, but you must land in an empty space. If that space has a peg in it, you can't jump.

Typing It In

Showdown is written entirely in BASIC. To avoid typing errors, enter the program with *The Automatic Proofreader*; see "Typing Aids" elsewhere in this sec-

tion. Be sure to save a copy of the program when you've finished typing it in.

Let's Play

When you run *Showdown*, you'll be asked whether you want to play or watch a replay of an earlier game. Since there will be nothing to watch at first, press P for play.

You'll then be asked whether you want to play singles or a combined effort. If you elect to play alone, make sure your joystick is in port 2. When two people play, two joysticks are required, and players take turns jumping pegs.

Pegs are removed automatically when you jump them. Remember that you can jump a peg only if you are next to it and the space on the other side of the jumped peg is vacant. You can only jump up, down, left, or right. Diagonal moves are not allowed.

Use the joystick to position your cursor on any peg you like. To jump, press the fire button and then move the stick in the direction you want to jump. If the move is legal, the computer will make the move and remove the jumped piece. You'll get a message if a move is illegal.

When you have removed as many pegs as possible, press the @ key to receive your score and a message about how well you played. If you are sharp and have planned your moves carefully, it's possible to remove all the pegs but one.

Watch a Replay

When you've finished a game, you'll be asked if you want to save it. Saving games will give you a chance to watch each move again and see where you went wrong. It'll also give you a chance to prove to others how brilliantly you played.

If you decide to save a game, *Showdown* will ask for a filename and then your name. The game and each move will be saved to disk.

To see a saved game, press R for replay on the opening screen and supply the filename. The game board will appear, and *Showdown* will automatically play back every move you made during that game. You can slow down the replay moves by pressing L or make them move faster by pressing F.

SHOWDOWN

```

QF 100 DIMF(2000),G(2000)
FR 110 GOSUB 880
AK 120 GOSUB1000
PC 130 S = 1475:O=1274:B=1391:
      C=1397:M=0:W=0:F=0:G=0:
      U=0
RA 140 PRINT "{CLR}{HOME}{BLK}"
      :POKE 53280,13:POKE5328
      1,12
JA 150 PRINT "{4 DOWN}
      {10 RIGHT}{RVS}
      {4 SPACES}{DOWN}{LEFT}
      {SPACE}{DOWN}{LEFT}
      {5 LEFT}{UP}{LEFT}
      {UP}{LEFT} "
HB 160 PRINT "{HOME}{7 DOWN}
      {7 RIGHT}{RVS}
      {3 SPACES}{OFF}WWW{RVS}
      {3 SPACES}{OFF}{UP}
      {6 LEFT}WWW"
RX 170 PRINT "{DOWN}{7 RIGHT}
      {RVS}{DOWN}{LEFT}
      {DOWN}{LEFT}{DOWN}
      {LEFT}{3 SPACES}{OFF}W
      {RVS}W{OFF}W{RVS}
      {3 SPACES}{UP}{LEFT}
      {UP}{LEFT}{UP}{LEFT}
      {8 LEFT}{OFF}";
SP 180 PRINT "WWW{DOWN}
      {7 LEFT}WWW WWW"
XS 190 PRINT "{8 RIGHT}WWW{WWW}"
HX 200 PRINT "{DOWN}{9 RIGHT}
      {RVS}{OFF}WWW{RVS}
      {OFF}"
FA 210 PRINT "{9 RIGHT}{RVS}
      {5 SPACES}"
PX 220 IFH=-1THEN 1190
GQ 230 V=2
KX 240 IFV=3THEN V=1
SM 250 IFI=0THENV=2
MG 260 JO=USR(V):GETAS
HS 270 IF(JOAND15)=1THENW=-40:
      GOTO480
FC 280 IF(JOAND15)=4THENW=-1:G
      OTO480
SR 290 IF(JOAND15)=8THENW=1:GO
      TO480
JJ 300 IF(JOAND15)=2THENW=40:G
      OTO480
HE 310 IF(JOAND16)=0THEN GOTO3
      40
EE 320 IF AS ="@" THEN 610
BH 330 GOTO 240
DQ 340 JO=USR(V):IF(JOAND15)=0
      THEN GOTO340
DD 350 IF(JOAND15)=1THENW=-40:
      GOTO400
BH 360 IF(JOAND15)=4THENW=-1:G
      OTO400
AJ 370 IF(JOAND15)=8THENW=1:GO
      TO400
DX 380 IF(JOAND15)=2THENW=40:G
      OTO400
KQ 390 GOTO 240
QS 400 Y=S+W:R=0:IF PEEK(S)=21
      5THEN R=R+1

```

```

KF 410 IFPEEK(Y)=87THENR=R+1
GG 420 IFPEEK(S+W+W)=32THENR=R
      +1
KF 430 IFR=3 THEN 450
BX 440 GOTO 530
JE 450 M=M+1:POKES,32:POKES+W,
      32:GOSUB560:POKE S+W+W,
      215:S=S+W+W:V=V+1:U=U+1
XH 460 F(U)=1:G(U)=W
PB 470 GOTO 240
JS 480 J=0:Z=PEEK(S):Y=S+W :IF
      PEEK(Y)=87THENQ=87:J=J+
      1
AH 490 IFPEEK(Y)=32THENQ=32:J=
      J+1
FD 500 IF J=1 THEN 520
SB 510 GOSUB 530
KH 520 POKES,Z-128:POKES+W,Q+1
      28:S=S+W:U=U+1:F(U)=0:G
      (U)=W:GOTO 240
QM 530 PRINT "{HOME}{22 DOWN}IL
      LEGAL MOVE":GOSUB 560
DQ 540 PRINT "{HOME}{22 DOWN}
      {12 SPACES}"
SG 550 GOTO{2 SPACES}240
HR 560 REM
EE 570 POKE54296,15:POKE54277,
      64:POKE54273,162:POKE54
      272,37
SQ 580 POKE54276,17:FORT=1TO20
      0:NEXT
HJ 590 POKE54276,16:FORT=1TO50
      :NEXT
HP 600 RETURN
MK 610 J=32-M:F(U+1)=-1:G(U+1)
      =0
BX 620 PRINT "{CLR}{2 DOWN}";J;
      "PEGS REMAINING{2 DOWN}
      "
AR 630 IFJ>10THEN PRINT"POOR!":
      W=-1:GOTO700
FG 640 IFJ>7THEN PRINT"SATISFA
      CTORY PLAY!":W=-1:GOTO7
      00
HA 650 IFJ>5THEN PRINT"GOOD!":
      W=4:GOTO700
RH 660 IFJ>3THEN PRINT"GREAT!":
      W=5:GOTO700
BQ 670 IFJ>2THEN PRINT"WELL PL
      AYED!":W=11:GOTO700
FH 680 IFJ>1THEN PRINT"MISSED!
      ":W=6:GOTO700
BX 690 IFJ>0THEN PRINT"DID IT!
      ":W=6:GOTO700
EB 700 PRINT "{3 DOWN}WANT TO S
      AVE? (Y/N)"
QF 710 GETK$:IF K$=""THEN710
JB 720 IF K$<>"N"ANDK$<>"Y"THE
      N 710
KQ 730 IFK$="N" THEN 800
XF 740 INPUT"FILENAME";N$:INPU
      T"YOUR NAME";M$
SR 750 OPEN15,8,15:OPEN2,8,2,"
      @0: "+N$+",S,W"
HG 760 PRINT#2,M$:FORV=1TOU+1
JB 770 PRINT#2,F(V)
RM 780 PRINT#2,G(V):NEXT V
JS 790 CLOSE2:CLOSE15

```

```

AA 800 PRINT "{3 DOWN}WANT TO P
      LAY? (Y/N)"
FB 810 IFW<0THENGOTO840
JD 820 QZ=4*40:FORK=QZ+55336TO
      QZ+55336+W:POKEK,V:V=V+
      1:IFV>255THENV=0
QP 830 NEXT K
AM 840 GET M$:IF M$="" THEN 81
      0
CG 850 IF M$="N"THENPRINT"
      {CLR}":END
PB 860 IF M$="Y" THENGOTO 120
JQ 870 GOTO 840
MK 880 JJ=49152:JH=INT(JJ/256)
      :JL=JJ-JH*256:POKE785,J
      L:POKE786,JH
SC 890 FORK=JJTOJJ+67:READ Y:P
      OKEK,Y:NEXT
RQ 900 DATA 120,70,97,176,21,1
      69,127,141
FS 910 DATA 0,220,173,1,220,20
      1,255,240
QE 920 DATA 4,169,31,208,13,17
      3,0,220
PC 930 DATA 16,8,169,255,141,0
      ,220,173
XC 940 DATA 1,220,41,31,73,15,
      208,4
HH 950 DATA 133,97,240,23,133,
      98,169,136
BA 960 DATA 133,97,169,0,133,9
      9,133,100
CX 970 DATA 133,101,133,102,19
      8,97,6,98
CF 980 DATA 16,250,88,96
CE 990 RETURN
QB 1000 PRINT "{CLR}{2 DOWN}PLA
      Y, WATCH A REPLAY (P/R
      )"CHR$(142)
ER 1010 GETF$:IFF$=""THEN1010
RR 1020 IFF$="P" THEN 1050
KR 1030 IFF$="R"THEN 1120
HS 1040 GOTO 1010
JQ 1050 PRINT "{CLR}{2 DOWN}ONE
      OR TWO PLAYER GAME? (
      1/2)"
GR 1060 GET I$:IFI$=""THEN106
      0
PB 1070 IFI$="1"THEN I=0:GOTO1
      00
DG 1080 IFI$="2" THENI=1:GOTO
      {SPACE}990
QH 1090 GOTO 1060
JQ 1100 H=0:PRINT "{2 DOWN}JOYS
      TICK IN PORT 2"
SP 1110 PRINT"PRESS "CHR$(34)"
      @"CHR$(34)" TO END":FO
      R E=1 TO 900:NEXT:RETU
      RN
JF 1120 U=0:N=0:INPUT"FILENAME
      ";N$
QR 1130 OPEN15,8,15:OPEN2,8,2,
      "0: "+N$+",S,R":INPUT#2
      ,M$
MK 1140 GOTO 1330
EA 1150 INPUT#2,F(U),G(U)
DS 1160 IFF(U)=-1 THEN U=U-1:G
      OTO1180

```



```

KF 1170 U=U+1:GOTO 1150
FR 1180 H=-1:PRINT "{CLR}":GOTO
150
XD 1190 S=1475:TI%=200
XH 1200 FOR V=0TOU
GJ 1210 E=S+G(V):GETAS
KR 1220 IF F(V)=0 THEN POKES,PE
EK(S)-128:POKE E,PEEK(
E)+128:S=S+G(V)
EG 1230 IF F(V)=1 THEN POKES,32
:POKEE,32:POKEE+G(V),2
15:S=S+G(V)+G(V):GOSU
B560
JP 1240 IFA$="F" THEN TI%=TI%-50
MF 1250 IFA$="L" THEN TI%=TI%+50
CJ 1260 IF TI%>1000 THEN TI%=100
0
RA 1270 IF TI%<0 THEN TI%=0
HR 1280 FORA=1TO TI%:NEXTV
:PRINT "BY:";MS
QH 1290 PRINT "{2 DOWN}{RVS}PRE
SS SPACE BAR TO CONTIN
UE"
HJ 1300 GETAS:IFA$<>" " THEN 13
00
JA 1310 CLOSE2:CLOSE15
SR 1320 RESTORE:GOTO 110
XM 1330 INPUT#15,EN,EM$,ET,ES
XQ 1340 IF EN#0 THEN PRINT EM$:GO
TO 1360
AH 1350 GOTO 1150
XH 1360 CLOSE15:CLOSE2:GOTO 11
20

```

Arihant Jain lives in Ludhiana, a city in northwest India. □

MEDIUM-DENSITY DRIVER

By Matthew Spinks

Over the years, I've done a good deal of graphics work on my computer that has included plotting graphs and drawing pictures. I've always been frustrated by the high-resolution graphics system used by the 64. It's generally more trouble than it's worth when all you want to do is plot a simple graph or picture.

At the other extreme of the graphics spectrum, the resolution of the normal text screen is usually too low to provide the detail required by straightforward graphs or pictures. What is needed is a graphics mode between the two extremes, a mode which offers a reasonable resolution but avoids the complexity associated with bitmapped graphics.

Such a graphics mode does exist. If you enter `PRINT CHR$(190):PRINT`

`CHR$(188):PRINT CHR$(187):PRINT CHR$(172)`, you'll see four characters on the screen. Each one fills one quadrant of a whole text cell. These characters enable the normal text screen to be turned into a medium-resolution graphics screen which has twice the resolution of the ordinary text screen. This format provides new screen dimensions of 80 points horizontally by 50 points vertically, an overall resolution of 4000 plot points.

This medium-density graphics mode has an attractive, chunky feel to it and is excellent for plotting graphs and drawing simple pictures. It also allows text and graphics to coexist peacefully. Unlike bitmap mode, the medium-density graphics mode requires no extra memory to store graphics data, and it requires only a small graphics driver. Perhaps best of all, the medium-density graphics mode is simple and easy to use.

Entering the Program

Medium-Density Driver is a short routine written entirely in machine language. To enter it, use *MLX*, our machine language entry program; see "Typing Aids" elsewhere in this section. When *MLX* prompts, respond with the following values.

Starting address: 033C
Ending address: 03D3

When you've finished typing, be sure to save a copy of the program before exiting *MLX*.

The driver sits safely in the cassette buffer, leaving the overused area at 49152 (\$C000) free for your own programs. This lets you plot individual points to the normal text screen.

After you've typed in a copy of the driver, you can then use it to create your own medium-density graphic screens. To use it, simply load the machine language program with the ,8,1 extension and type NEW. This NEW command is necessary because it resets some important BASIC pointers.

The Plot Thickens

To plot graphs or pictures, simply use the command `SYS828, x, y, on/off, color`. Here *x* and *y* are the screen coordinates for points to be plotted. The

range is 0-79 on the *x*-axis and 0-49 along the *y*-axis. On/off is a flag which determines whether or not a point is plotted or erased. If on/off = 1, a point will be plotted. If on/off = 0, a point will be erased. Color, of course, is the color of the point to be plotted and should be in the range 0-15, representing the standard Commodore colors.

For example, to plot a white point at the top left-hand corner of the screen, enter the following command:

SYS828, 0, 0, 1, 1

Similarly, to erase a point at the opposite corner (the bottom right-hand corner), the command `SYS828, 79, 49, 0, 1` would be used. Note that despite the fact that we are erasing a point, the color must still be specified. This is necessary because the program checks all parameters, and if any value falls outside the ranges mentioned or if any parameter is missing, you'll get a `SYNTAX ERROR`.

Points to Ponder

Because the medium-density graphics mode uses the normal text screen and color memories, setting the color of one point will also affect the color of the neighboring three points. Some care must be taken when plotting in more than one color to achieve the desired effect. Although this may seem like a drawback at first, it does have the advantage of allowing text and standard Commodore graphics characters to be integrated onto the graphics screen.

Text can be printed and character values can be poked to the screen in the normal way. Note, however, that with the graphics driver you can neither erase text or nongraphics characters nor plot over text or other characters. This prevents text and other graphics from being accidentally erased.

A Demonstration

Demo is a short demonstration program written entirely in BASIC. It will give you some idea of how you can use the driver. To help prevent typing errors, use *The Automatic Proofreader* to type it in; see "Typing Aids" elsewhere in this section.

Demo plots Lissajous figures. These are a series of curves found by combining perpendicular harmonic motions. They are commonly exhibited by feeding two harmonic frequencies into an oscilloscope's X and Y input circuits. (Don't worry. You don't have to understand Lissajous figures to see how the program works. They're easier to demonstrate than to explain.)

Before running the demonstration, make sure *Driver* is already in memory. When running the demonstration, try experimenting with the values the program asks for. Entering 1,2 will produce entirely different results than will 2,1.

The patterns produced will be in monochrome, but you can easily add color by changing the value of the color variable, C, in line 270. For a rainbow of color, try *Demo* with these lines added.

```
262 C=C+1
264 IF C=16 THEN C=0
```

Now that you have an idea of how *Medium-Density Driver* works, try creating some figures or patterns of your own.

MEDIUM DENSITY DRIVER

```
033C:A0 03 8C D2 03 20 00 E2 8D
0344:8A AC D2 03 D9 BE 03 B0 C5
034C:6E 99 D3 03 88 10 EB A9 A0
0354:02 8D D7 03 4E D5 03 90 4A
035C:06 0E D7 03 0E D7 03 4E 38
0364:D6 03 90 03 4E D7 03 AE 5F
036C:D5 03 20 F0 E9 AD D6 03 E7
0374:18 65 D1 85 D1 90 02 E6 2E
037C:D2 20 24 EA A0 00 B1 D1 61
0384:A2 0F DD C2 03 F0 04 CA 36
038C:10 F8 60 AD D4 03 F0 1A 6E
0394:E0 0F F0 15 AD D3 03 91 92
039C:F3 8A 2C D7 03 D0 0A 18 C9
03A4:6D D7 03 AA BD C2 03 91 F2
03AC:D1 60 8A 2C D7 03 F0 F9 6E
03B4:38 ED D7 03 4C A7 03 4C D0
03BC:08 AF 10 02 32 50 20 7C 64
03C4:7E E2 6C E1 7F FB 7B FF 51
03CC:61 EC 62 FE FC A0 00 00 65
```

DEMO

```
CX 100 REM DRIVER DEMONSTRATIO
N
BF 110 REM COPYRIGHT 1991 - CO
MPUTE PUBLICATIONS INTL
LTD - ALL RIGHTS RESER
VED
JB 120 REM MAKE SURE DRIVER IS
IN MEMORY!
DK 130 :
KX 135 PI=3.14159
```

```
JS 140 POKE 53280,11:POKE 5328
1,11
GK 150 PRINTCHR$(147)CHR$(5)
RD 160 PRINTTAB(11)"LISSAJOUS
{SPACE}FIGURES"CHR$(17)
RX 170 PRINT"PRESS ANY KEY AFT
ER VIEWING FIGURE"
QE 180 PRINTCHR$(17)"ENTER ANY
TWO NUMBERS, EACH"
BH 190 INPUT"WITH VALUES LESS
{SPACE}THAN 5";X,Y
DR 200 IF X>5 OR Y>5 THEN 180
HP 210 PRINTCHR$(147)
XM 220 FL=1:GOSUB 260
MR 230 POKE 198,0:WAIT 198,1
QP 240 FL=0:GOSUB 260
SF 250 END
RR 260 FOR T=1 TO 2*PI*100/(10
*PI*(X+Y))
JK 270 SYS 828,(1+SIN(X*T))*40
,(1+COS(Y*T))*25,FL,C
SD 280 NEXT
SK 290 RETURN
```

Matthew Spinks, who wrote *Loader-Maker* (May 1991), lives in Erica, Victoria, Australia. □

RAPIDFORMAT 128

By Mahmood Hasan Merchant

A number of fast formatting programs have been around for the 64 ever since the 1541 disk drive was introduced by Commodore. These programs greatly improve the performance of the drive in terms of time saved.

Commodore probably took a lesson from these programmers and added a much more efficient format routine into its 1571 disk drive. The drive formats a double-sided disk in 41 seconds, but wouldn't we all appreciate an even faster procedure? *RapidFormat 128* should do the trick.

RapidFormat 128 is an easy-to-use, prompt-driven program for the 128 that cuts almost in half the time required to format all 70 tracks of a double-sided disk. It will format a single-sided disk in a mere 12 seconds.

Getting Started

RapidFormat 128 is written entirely in BASIC. To help prevent typing errors, use *The Automatic Proofreader* to type it in; see "Typing Aids" elsewhere in this section. When you've finished typing, be sure to save a copy of the program. When you type RUN, the data

will be read and written to disk as *RapidFormat*, a machine language program.

Once *RapidFormat* has been generated, it can be loaded and activated with the command RUN "RAPIDFORMAT". At this point you should remove the disk containing the program and insert the disk which is to be formatted. You are prompted to indicate whether you wish to format only the top side (for 1541 use) or both sides of the disk. If you frequently need to access your files both in the 64 and 128 modes, then it may be a good idea to format only the top side of the disk. This will prevent the annoying *Illegal Track or Sector* error message which results when part of the file being accessed lies on a disk's second side.

To V or Not to V?

Next you have to specify whether you wish to verify the format. If verification is enabled, each sector on every track is read and checked for errors. If any are spotted, they are reported by the program. However, choosing this option will slow down the formatting somewhat. To format a disk at maximum speed, omit the verify option.

This option is provided to meet the needs of various users. Write errors occur rarely with the 1571, and if you have reasonable faith in the head alignment of your drive (1571s are more trustworthy in this regard than older 1541s), then you may save time by choosing not to verify. As long as the disk used is at least of average quality, there shouldn't be any problems.

If, however, the idea of not verifying makes you nervous, then you have the option. I would strongly advise you to verify if you are using generic or low-quality disks or if you wish to format both sides of a disk which is certified only for single-side use. In these cases, the caution and the extra time are probably worth it.

Enter a name for the disk as you would in a conventional format routine. Be sure it is no longer than 16 characters and is followed by a 2-character ID. This ID is written as a sort of signature to every sector on the disk, and its main purpose is to indicate to the drive when a disk has been changed.

Once you press Return, the disk will

PROGRAMS

start to format. Make sure that the disk containing *RapidFormat* is not in the drive. To be safe, put write-protect tabs on disks that contain programs or valuable data. *RapidFormat* checks for write-protect tabs. If it finds one, the disk will not be formatted, and an error message will be displayed. Using write-protect tabs on all valuable disks is a good practice to follow.

How It Works

RapidFormat works by reprogramming the disk drive. It transfers a section of code to the buffer at address \$0500. Once activated, the program copies the standard format routine from the drive ROM to the internal RAM and makes a few changes to it.

If the verify option is not chosen, these routines are bypassed. Additional time is saved by using a fixed value to space out sectors on all tracks. The standard format routine writes and rewrites on each track to calculate the individual length of gaps between sectors.

This modification, coupled with faster changing of tracks, brings about the speed improvement of *RapidFormat*. Disks formatted with this program work just as well as those formatted using the standard routine.

RAPIDFORMAT 128

```
SH 10 BANK1:SCNCLR:COLOR0,15:COLOR4,15:COLOR5,2
EC 20 PRINTCHR$(18)"
    {16 SPACES}786/110
    {17 SPACES}";
PC 30 PRINT"{11 SPACES}RAPIDFORMAT - 1571{11 SPACES}";
MQ 40 PRINT" COPYRIGHT 1991 -
    {SPACE}COMPUTE PUBS INTL LTD ";
DE 50 PRINT"{11 SPACES}ALL RIGHTS RESERVED{10 SPACES}";
AG 70 SA=7169:EA=8153:DT=16
DA 80 PRINTCHR$(17)SPC(14)"READING ML!"CHR$(17)CHR$(17)
PF 90 FORI=0TODT-2:READ D$:D=D
    EC(D$)
GS 100 CHAR1,11,10:PRINT"LOADING AT:{2 SPACES}";HEX$(SA+I)
QM 110 POKESA+I,D:CK=CK+D:NEXT
    :READ D$:D=DEC(D$):CK=C
    KAND255
DB 120 IFD<>CKTHENBEGIN
QK 130 :PRINTCHR$(17)"DATA ERR
```

```
OR IN LINE";
KD 140 :PRINTPEEK(65)+256*PEEK
    (66):STOP
FR 150 BEND
PR 160 SA=SA+DT-1:CK=0:IFSA<=E
    AGOTO90
JK 170 PRINTCHR$(17)CHR$(17)"P
    RESS "CHR$(18)" RETURN
    {SPACE}";
XA 180 PRINTCHR$(146)" TO SAVE
    'RAPIDFORMAT'";:INPUTD
    $
XA 190 BSAVE"RAPIDFORMAT",B1,P
    (7169) TO P(EA+1):PRINT
    D$$
MB 200 END
QR 210 :
JS 220 :
FC 1000 DATA 49,1C,0A,00,99,22
    ,93,22,A3,35,29,22,12,
    20,52,86
BH 1010 DATA 20,41,20,50,20,49
    ,20,44,20,46,20,4F,20,
    52,20,05
HM 1020 DATA 4D,20,41,20,54,20
    ,2D,20,31,35,37,31,20,
    92,22,31
HK 1030 DATA 3A,20,4E,24,B2,22
    ,22,3A,56,24,B2,22,22,
    3A,49,EF
QK 1040 DATA 44,24,B2,22,22,3A
    ,53,24,B2,22,22,00,74,
    1C,14,A9
XE 1050 DATA 00,99,A3,35,29,22
    ,12,20,20,20,28,31,39,
    39,30,29
XM 1060 DATA 29,20,20,4D,41,48
    ,4D,4F,4F,44,20,4D,45,
    52,43,B5
XE 1070 DATA 48,41,4E,54,20,20
    ,20,92,22,00,9E,1C,1E,
    00,99,B0
KF 1080 DATA 22,11,11,46,4F,52
    ,4D,41,54,20,54,59,50,
    45,3A,A9
BS 1090 DATA 20,20,12,20,31,20
    ,92,20,20,42,4F,54,48,
    20,53,35
FG 1100 DATA 49,44,45,53,11,22
    ,00,BE,1C,28,00,99,A3,
    31,34,FB
SX 1110 DATA 29,22,12,20,32,20
    ,92,20,20,54,4F,50,20,
    53,49,50
PQ 1120 DATA 44,45,20,4F,4E,4C
    ,59,22,00,D4,1C,32,00,
    99,A3,6B
XC 1130 DATA 31,35,29,22,11,31
    ,9D,9D,9D,22,3B,3A,85,
    53,24,5D
XB 1140 DATA 00,EC,1C,3C,00,8B
    ,A8,53,24,B2,22,31,22,
    AF,A8,6C
PX 1150 DATA 53,24,B2,22,32,22
    ,89,35,30,00,FF,1C,41,
    00,8B,74
PH 1160 DATA 53,24,B2,22,32,22
    ,A7,53,24,B2,22,30,22,
```

```
00,12,F5
AJ 1170 DATA 1D,43,00,53,24,B2
    ,C7,28,C6,28,53,24,29,
    AB,34,E5
XB 1180 DATA 38,29,00,38,1D,46
    ,00,99,22,11,11,56,45,
    52,49,0F
EJ 1190 DATA 46,59,3F,20,28,59
    ,2F,4E,29,22,A3,31,35,
    29,22,9B
GS 1200 DATA 4E,9D,9D,9D,22,3B
    ,3A,85,4E,24,00,50,1D,
    50,00,70
AB 1210 DATA 8B,A8,4E,24,B2,22
    ,59,22,AF,A8,4E,24,B2,
    22,4E,DF
EX 1220 DATA 22,89,31,30,00,6A
    ,1D,55,00,56,24,B2,22,
    30,22,88
BB 1230 DATA 3A,8B,4E,24,B2,22
    ,59,22,A7,56,24,B2,22,
    31,22,CE
XR 1240 DATA 00,7D,1D,57,00,56
    ,24,B2,C7,28,C6,28,56,
    24,29,9D
MX 1250 DATA AB,34,38,29,00,94
    ,1D,5A,00,99,22,11,11,
    4E,41,B7
XX 1260 DATA 4D,45,22,A3,31,33
    ,29,3B,3A,85,4E,24,00,
    AD,1D,1A
PK 1270 DATA 64,00,8B,C3,28,4E
    ,24,29,B2,30,B0,C3,28,
    4E,24,64
HD 1280 DATA 29,B1,31,36,89,31
    ,30,00,C2,1D,6E,00,99,
    22,11,44
BB 1290 DATA 49,44,22,A3,31,33
    ,29,3B,3A,85,49,44,24,
    00,D4,5E
PM 1300 DATA 1D,78,00,8B,C3,28
    ,49,44,24,29,B3,B1,32,
    89,31,35
AX 1310 DATA 30,00,DE,1D,82,00
    ,9E,37,37,32,30,00,FB,
    1D,8C,BF
EH 1320 DATA 00,99,A3,31,34,29
    ,22,11,11,11,12,20,46,
    4F,52,38
RK 1330 DATA 4D,41,54,54,49,4E
    ,47,20,92,22,00,26,1E,
    96,00,C2
EK 1340 DATA 9F,31,35,2C,38,2C
    ,31,35,3A,98,31,35,2C,
    22,55,D6
GA 1350 DATA 34,22,53,24,56,24
    ,49,44,24,22,2C,22,4E,
    24,3A,14
FE 1360 DATA A0,31,35,3A,99,44
    ,53,24,00,00,00,A6,BA,
    A0,0F,A3
XD 1370 DATA A9,00,20,38,F7,85
    ,B7,20,C0,FF,A6,B8,20,
    C9,FF,59
ME 1380 DATA 20,7D,FF,55,30,3E
    ,52,01,00,20,CC,FF,A9,
    05,A0,EB
RB 1390 DATA 00,85,FB,84,FA,A2
```


,0A,86,FE,A9,AF,85,FC,
A9,1E,CE
XA 1400 DATA 85,FD,A5,BA,20,3E
,E3,A9,6F,20,D2,E4,A9,
4D,20,26
BH 1410 DATA 03,E5,A9,2D,20,03
,E5,A9,57,20,03,E5,A5,
FA,20,8D
DH 1420 DATA 03,E5,A5,FB,20,03
,E5,A9,20,20,03,E5,A0,
00,B1,B2
EF 1430 DATA FC,20,03,E5,C8,C0
,20,90,F6,20,26,E5,18,
A5,FC,16
EE 1440 DATA 69,20,85,FC,90,02
,E6,FD,18,A5,FA,69,20,
85,FA,3E
RR 1450 DATA 90,02,E6,FB,C6,FE
,D0,AF,4C,E7,FF,4C,46,
05,20,9F
CJ 1460 DATA C2,05,20,7C,87,A2
,00,86,0B,A2,24,86,0A,
AD,02,22
BD 1470 DATA 02,85,1F,F0,08,A9
,B0,85,02,A5,02,30,FC,
A2,01,F4
CR 1480 DATA 86,0A,A9,E0,85,02
,A5,02,30,FC,C9,02,90,
03,4C,1D
HG 1490 DATA 0A,E6,20,05,F0,A9
,24,A6,1F,F0,02,A9,47,
A0,07,20
RR 1500 DATA 8C,7A,02,4C,73,A7
,AD,00,1C,29,10,D0,05,
A9,08,F6
SM 1510 DATA 4C,B5,99,A9,60,85
,20,A5,0A,85,51,85,67,
20,4B,24
MG 1520 DATA F2,85,43,20,50,06
,A5,1F,F0,10,20,F8,93,
18,A5,5C
BR 1530 DATA 51,69,23,85,51,20
,50,06,20,F5,93,A6,0A,
E8,E0,49
AG 1540 DATA 24,D0,12,86,14,20
,E7,87,C6,14,D0,F9,A2,
12,86,0B
PG 1550 DATA 0A,A9,01,4C,B5,99
,86,0A,BD,08,94,85,44,
AD,00,AD
GP 1560 DATA 1C,29,9F,05,44,8D
,00,1C,20,DF,87,20,DF,
87,A5,87
HJ 1570 DATA 1F,D0,03,4C,46,05
,C6,64,C6,64,20,F8,93,
20,DF,87
JC 1580 DATA 87,20,DF,87,20,F5
,93,4C,46,05,20,FE,05,
A9,E9,01
RC 1590 DATA A0,06,8D,77,07,8C
,78,07,A9,01,8D,CD,06,
A9,0A,79
HQ 1600 DATA 8D,20,06,A9,08,8D
,26,06,A9,C5,A0,07,8D,
B9,07,7F
PX 1610 DATA 8C,BA,07,A9,60,8D
,EE,07,AD,03,02,D0,05,
A9,4C,54

KX 1620 DATA 8D,9A,07,60,B1,14
,91,2C,C8,60,AD,04,02,
AC,05,9C
AM 1630 DATA 02,85,12,84,13,A9
,93,A0,9B,85,14,84,15,
A9,06,88
DC 1640 DATA A0,50,85,2D,84,2C
,A0,00,20,F8,05,D0,FB,
E6,15,D5
FF 1650 DATA E6,2D,20,F8,05,C0
,9E,D0,F9,60,00,00,00,
00,00,B7

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TYPING AIDS

MLX, the machine language entry program for the 64 and 128, and *The Automatic Proofreader* are utilities that help you type in Gazette programs without making mistakes. These labor-saving utilities are on each Gazette Disk and printed in issues of Gazette through June 1990.

If you don't have access to a back issue or to one of our disks, write and we'll send you free copies of both of these handy utilities. We'll also include instructions on how to type in Gazette programs. Please enclose a self-addressed, stamped envelope. Write to Typing Aids, COMPUTE's Gazette, 324 West Wendover Avenue, Greensboro, North Carolina 27408.

Gazette is looking for utilities, games, applications, educational programs, and tutorial articles. If you've created a program that you think other readers might enjoy or find useful, send it on disk to

Gazette Submissions Reviewer
COMPUTE Publications
324 W. Wendover Ave.
Ste. 200
Greensboro, NC 27408

Please enclose an SASE if you wish to have the materials returned.

ONLY ON DISK

In addition to the type-in programs found in each issue of the magazine, Gazette Disk offers bonus programs and original 64 and 128 artwork. Here are the programs featured this month.

Super Cataloguer 128

Diego Martin Zamboni
Mexico City, Mexico

Catalogue all of your software (up to 2500 titles) quickly and easily with this outstanding utility for the 128. An 80-column monitor is required.

Read a disk directory, select which files you wish to add to the list, and then save them, sort them, search through them, and delete names at the touch of a key. If you can't recall the contents of a file, the program will list it to the screen. It even works with sequential, user, and relative files.

Super Cataloguer 128 is also a great disk manager. You can edit filenames and delete files, whole disks, or even portions of disks. The program provides memory information, prints lists in several modes, and much more. This is one utility all 128 users should have.

Spanish Vocabulary Quiz

Christopher M. Stoy
Edensburg, PA

To help you use *Spanish Vocabulary Quiz*, one of this issue's type-in programs, see page G-25, we have included ten vocabulary files, containing dozens of English words and their Spanish equivalents. Load and use any of these files from the program's main menu.

Machine Language Entry Program for Commodore 64

Ottis R. Cowper

Type in and save some copies of *MLX*—you'll want to use it to enter future ML programs from *Gazette*. When you're ready to enter an ML program, load and run *MLX*. It asks you for a starting address and an ending address. These addresses appear in the article accompanying the *MLX*-format program listing you're typing.

If you're unfamiliar with machine language, the addresses (and all other values you enter in *MLX*) may appear strange. Instead of the usual decimal numbers you're accustomed to, these numbers are in *hexadecimal*—a base 16 numbering system commonly used by ML programmers. Hexadecimal—hex for short—includes the numerals 0–9 and the letters A–F. But even if you know nothing about ML or hex, you should have no trouble using *MLX*.

After you've entered the starting and ending addresses, you'll be offered the option of clearing the workspace. Choose this option if you're starting to enter a new listing. If you're continuing a listing that's partially typed from a previous session, don't choose this option. A functions menu will appear. The first option in the menu is Enter Data. If you're just starting to type in a program, pick this. Press the E key and type the first number in the first line of the program listing. If you've already typed in part of a program, type the line number where you stopped typing at the end of the previous session (be sure to load the partially completed program before you resume entry). In any case, make sure the address you enter corresponds to the address of a line in the listing you are entering. Otherwise, you'll be unable to enter the data correctly. If you pressed E by mistake, you can return to the command menu by pressing Return alone when asked for the address. (You can get back to the menu from most options in the program by pressing Return with no other input.)

Entering a Listing

Once you're in Enter mode, *MLX* prints the address for each program line for you. You then type in all nine numbers on that line, beginning with the first two-digit number after the colon (:). Each line represents eight data bytes and a checksum. Although an

MLX-format listing appears similar to the "hex dump" listings from a machine language monitor program, the extra checksum number on the end allows *MLX* to check your typing.

When you enter a line, *MLX* recalculates the checksum from the eight bytes and the address and compares this value to the number from the ninth column. If the values match, you'll hear a bell tone, the data will be added to the workspace area, and the prompt for the next line of data will appear. But if *MLX* detects a typing error, you'll hear a low buzz and see an error message. The line will then be re-displayed for editing.

Invalid Characters Banned

Only a few keys are active while you're entering data, so you may have to unlearn some habits. You *do not* type spaces between the columns; *MLX* automatically inserts these for you. You *do not* press Return after typing the last number in a line; *MLX* automatically enters and checks the line after you type the last digit.

64 MLX Keypad

7	8	9	0
4 U	5 I	6 O	F P
1 J	2 K	3 L	E :
A M	B ,	C .	D /
0 Space			

Only the numerals 0–9 and the letters A–F can be entered. If you press any other key (with some exceptions noted below), you'll hear a warning buzz. To simplify typing, a numeric keypad function is included. The keypad is active only while entering data. Addresses must be entered with the normal letter and number keys. The figure below shows the keypad configuration. *MLX* checks for transposed charac-

ters. If you're supposed to type in A0 and instead enter 0A, *MLX* will catch your mistake. There is one error that can slip past *MLX*: Because of the checksum formula used, *MLX* won't notice if you accidentally type FF in place of 00, and vice versa. And there's a very slim chance that you could garble a line and still end up with a combination of characters that adds up to the proper checksum. However, these mistakes should not occur if you take care while entering data.

Editing Features

To correct typing mistakes before finishing a line, use the Inst/Del key to delete the character to the left of the cursor. If you mess up a line badly, press Ctr/Home to start the line over. The Return key is also active, but only before any data is typed on a line. Pressing Return at this point returns you to the command menu. After you type a character, *MLX* disables Return until the cursor returns to the start of a line. Remember, press Ctr/Home to quickly get to a line-number prompt. To make corrections in a line that *MLX* has redisplayed for editing, compare the line on the screen with the one printed in the listing and then move the cursor to the mistake and type the correct key. The cursor-left and -right keys provide the normal cursor controls. (The Inst/Del key now works as an alternative cursor-left key.) You cannot move left beyond the first character in the line. If you try to move beyond the rightmost character, you'll reenter the line. During editing, Return is active; pressing it tells *MLX* to recheck the line. You can press the Ctr/Home key to clear the entire line if you want to start from scratch or if you want to get to a line-number prompt to use Return to get back to the menu.

Display Data

The second menu choice, Display Data, examines memory and shows the contents in the same format as the program listing (including the checksum). When you press D, *MLX* asks you for a starting address. Be sure that the starting address you give corresponds to a line number in the listing. Otherwise, the checksum display will be meaningless. *MLX* displays program lines until it reaches the end of the program, at

which point the menu is redisplayed. You can pause the display by pressing the space bar. (MLX finishes printing the current line before halting.) Press the space bar again to restart the display. To break out of the display and get back to the menu before the ending address is reached, press Return.

Other Menu Options

Two more menu selections let you save programs and load them back into the computer. These are Save File and Load File. When you press S or L, MLX asks you for the filename. You'll then be asked to press either D or T to select disk or tape.

You'll notice the disk drive starting and stopping several times during a load or save. This is normal behavior. MLX opens and reads from or writes to the file instead of using the usual LOAD and SAVE commands. Also note that the drive prefix O: is added to the filename (line 750), so this should not be included when entering the name. This also precludes the use of @ for save-with-replace, so be sure to give each version saved a different name.

Remember that MLX saves the entire workspace area from the starting address to the ending address, so the save or load may take longer than you might expect if you've entered only a small amount of data from a long listing. When you're saving a partially completed listing, make sure to note the address where you stopped typing.

MLX reports the standard disk or tape error messages if any problems are detected during the save or load. It also has three special load error messages: INCORRECT STARTING ADDRESS, which means the file you're trying to load does not have the starting address you specified when you ran MLX; LOAD ENDED AT address, which means the file you're trying to load ends before the ending address you specified when you started MLX; and TRUNCATED AT ENDING ADDRESS, which means the file you're trying to load extends beyond the ending address you specified when you started MLX. If you see one of these messages and feel certain that you've loaded the right file, exit and rerun MLX, being careful to enter the correct starting

and ending addresses.

The Quit menu option has the obvious effect—it stops MLX and enters BASIC. The Run/Stop key is disabled, so the Q option lets you exit the program without turning off the computer. (Of course, Run/Stop—Restore also gets you out.) You'll be asked for verification; press Y to exit to BASIC, or press any other key to return to the menu. After quitting, you can type RUN again and reenter MLX without losing your data, as long as you don't use the Clear Workspace option.

The Finished Product

When you've finished typing all the data for an ML program and saved your work, you're ready for the results. Refer to the corresponding article for details on loading and running the program.

An Ounce of Prevention

Don't take chances—use *The Automatic Proofreader* to type the new MLX, and then test your copy thoroughly before first using it to enter any significant amount of data. Make sure all the menu options work as they should. Enter fragments of the program starting at several different addresses; then use the display option to verify that the data has been entered correctly. Test the save and load options to ensure that you can recall your work from disk.

64 MLX

```
SS 10 REM VERSION 1.1: LINES 8
    30,950 MODIFIED, LINES 4
    85-487 ADDED
EK 100 POKE 56,50:CLR:DIM IN$,
    I,J,A,B,A$,B$,A(7),N$
DM 110 C4=48:C6=16:C7=7:Z2=2:Z
    4=254:Z5=255:Z6=256:Z7=
    127
CJ 120 FA=PEEK(45)+Z6*PEEK(46)
    :BS=PEEK(55)+Z6*PEEK(56)
    :H$="0123456789ABCDEF"
SB 130 R$=CHR$(13):L$="{LEFT}"
    :S$=" ":D$=CHR$(20):Z$=
    CHR$(0):T$="{13 RIGHT}"
CQ 140 SD=54272:FOR I=SD TO SD
    +23:POKE I,0:NEXT:POKE
    {SPACE}SD+24,15:POKE 78
    8,52
FC 150 PRINT "{CLR}"CHR$(142)CH
    R$(8):POKE 53280,15:POK
    E 53281,15
EJ 160 PRINT T$ "{RED}"{RVS}
    {2 SPACES}{8 @}
```

```
{2 SPACES}"SPC(28)"
{2 SPACES}{OFF}{BLU} ML
X II {RED}{RVS}
{2 SPACES}"SPC(28)"
{12 SPACES}{BLU}"
FR 170 PRINT "{3 DOWN}
    {3 SPACES}COMPUTE!'S MA
    CHINE LANGUAGE EDITOR
    {3 DOWN}"
JB 180 PRINT "{BLK}STARTING ADD
    RESS{4}";:GOSUB300:SA=A
    D:GOSUB1040:IF F THEN18
    0
GF 190 PRINT "{BLK}{2 SPACES}EN
    DING ADDRESS{4}";:GOSUB
    300:EA=AD:GOSUB1030:IF
    {SPACE}F THEN190
KR 200 INPUT "{3 DOWN}{BLK}CLEA
    R WORKSPACE {Y/N}{4}";A
    $:IF LEFT$(A$,1)<>"Y"TH
    EN220
PG 210 PRINT "{2 DOWN}{BLU}WORK
    ING...";:FORI=BS TO BS+
    EA-SA+7:POKE I,0:NEXT:P
    RINT"DONE"
DR 220 PRINTTAB(10)"{2 DOWN}
    {BLK}{RVS} MLX COMMAND
    {SPACE}MENU {DOWN}{4}":
    PRINT T$ "{RVS}E{OFF}NTE
    R DATA"
BD 230 PRINT T$ "{RVS}{OFF}ISP
    LAY DATA":PRINT T$
    {RVS}L{OFF}OAD FILE"
JS 240 PRINT T$ "{RVS}S{OFF}AVE
    FILE":PRINT T$ "{RVS}Q
    {OFF}UIT{2 DOWN}{BLK}"
JH 250 GET A$:IF A$=N$ THEN250
HK 260 A=0:FOR I=1 TO 5:IF A$=
    MID$( "EDLSQ",I,1) THEN A
    =I:I=5
FD 270 NEXT:ON A GOTO420,610,6
    90,700,280:GOSUB1060:GO
    TO250
EJ 280 PRINT "{RVS} QUIT ":INPU
    T "{DOWN}{4}ARE YOU SURE
    {Y/N}";A$:IF LEFT$(A$,
    1)<>"Y"THEN220
EM 290 POKE SD+24,0:END
JX 300 IN$=N$:AD=0:INPUTIN$:IF
    LEN(IN$)<>4THENRETURN
KF 310 B$=IN$:GOSUB320:AD=A:B$
    =MID$(IN$,3):GOSUB320:A
    D=AD*256+A:RETURN
PP 320 A=0:FOR J=1 TO 2:A$=MID
    $(B$,J,1):B=ASC(A$)-C4+
    (A$>"@")*C7:A=A*C6+B
JA 330 IF B<0 OR B>15 THEN AD=
    0:A=-1:J=2
GX 340 NEXT:RETURN
CH 350 B=INT(A/C6):PRINT MID$(
    H$,B+1,1);:B=A-B*C6:PRI
    NT MID$(H$,B+1,1);:RETU
    RN
RR 360 A=INT(AD/Z6):GOSUB350:A
    =AD-A*Z6:GOSUB350:PRINT
    " ";
BE 370 CK=INT(AD/Z6):CK=AD-Z4*
```



```

CK+Z5*(CK>Z7):GOTO390
PX 380 CK=CK+Z5*(CK>Z7)+A
JC 390 CK=CK+Z5*(CK>Z5):RETURN
QS 400 PRINT"{DOWN}STARTING AT
{4}";:GOSUB300:IF INS<>
NS THEN GOSUB1030:IF F
{SPACE}THEN400
EX 410 RETURN
HD 420 PRINT"{RVS} ENTER DATA
{SPACE}":GOSUB400:IF IN
S=NS THEN220
JK 430 OPEN3,3:PRINT
SK 440 POKE198,0:GOSUB360:IF F
THEN PRINT INS:PRINT"
{UP}{5 RIGHT}";
GC 450 FOR I=0 TO 24 STEP 3:BS
=SS:FOR J=1 TO 2:IF F T
HEN BS=MIDS(INS,I+J,1)
HA 460 PRINT"{RVS}"BSL$:IF I<
24THEN PRINT"{OFF}";
HD 470 GET AS:IF AS=NS THEN470
FK 480 IF(AS>"/"ANDAS<":")OR(A
S>"@ANDAS<"G")THEN540
GS 485 A=- (AS="M")-2*(AS=",")-
3*(AS=".")-4*(AS="/" )-5
*(AS="J")-6*(AS="K")
FX 486 A=A-7*(AS="L")-8*(AS=":
")-9*(AS="U")-10*(AS="I
")-11*(AS="O")-12*(AS="
P")
CM 487 A=A-13*(AS=SS):IF A THE
N AS=MIDS("ABCD123E456F
0",A,1):GOTO 540
MP 490 IF AS=RS AND((I=0)AND(J
=1)OR F)THEN PRINT BS;:
J=2:NEXT I=24:GOTO550
KC 500 IF AS="HOME" THEN PRIN
T BS:J=2:NEXT I=24:NEX
T:F=0:GOTO440
MX 510 IF(AS="{RIGHT}")ANDF TH
ENPRINT BSL$:GOTO540
GK 520 IF AS<>LS AND AS<>DS OR
((I=0)AND(J=1))THEN GOS
UB1060:GOTO470
HG 530 AS=LS+SS+LS:PRINT BSL$:
J=2-J:IF J THEN PRINT
{SPACE}LS;:I=I-3
QS 540 PRINT AS;:NEXT J:PRINT
{SPACE}SS;
PM 550 NEXT I:PRINT:PRINT"{UP}
{5 RIGHT}";:INPUT#3,INS
:IF INS=NS THEN CLOSE3:
GOTO220
QC 560 FOR I=1 TO 25 STEP3:BS=
MIDS(INS,I):GOSUB320:IF
I<25 THEN GOSUB380:A(I
/3)=A
PK 570 NEXT:IF A<>CK THEN GOSU
B1060:PRINT"{BLK}{RVS}
{SPACE}ERROR: REENTER L
INE {4}":F=1:GOTO440
HJ 580 GOSUB1080:B=BS+AD-SA:FO
R I=0 TO 7:POKE B+I,A(I
):NEXT
QQ 590 AD=AD+8:IF AD>EA THEN C
LOSE3:PRINT"{DOWN}{BLU}
** END OF ENTRY **{BLK}
{2 DOWN}":GOTO700
GQ 600 F=0:GOTO440
QA 610 PRINT"{CLR}{DOWN}{RVS}
{SPACE}DISPLAY DATA ":G
OSUB400:IF INS=NS THEN2
20
RJ 620 PRINT"{DOWN}{BLU}PRESS:
{RVS}SPACE{OFF} TO PAU
SE, {RVS}RETURN{OFF} TO
BREAK{4}{DOWN}"
KS 630 GOSUB360:B=BS+AD-SA:FOR
I=BTO B+7:A=PEEK(I):GOS
UB350:GOSUB380:PRINT SS
;
CC 640 NEXT:PRINT"{RVS}";:A=CK
:GOSUB350:PRINT
KH 650 F=1:AD=AD+8:IF AD>EA TH
ENPRINT"{DOWN}{BLU}** E
ND OF DATA **":GOTO220
KC 660 GET AS:IF AS=RS THEN GO
SUB1080:GOTO220
EQ 670 IF AS=SS THEN F=F+1:GOS
UB1080
AD 680 ONFGOTO630,660,630
CM 690 PRINT"{DOWN}{RVS} LOAD
{SPACE}DATA ":OP=1:GOTO
710
PC 700 PRINT"{DOWN}{RVS} SAVE
{SPACE}FILE ":OP=0
RX 710 INS=NS:INPUT{DOWN}FILE
NAME{4};:INS:IF INS=NS
{SPACE}THEN220
PR 720 F=0:PRINT"{DOWN}{BLK}
{RVS}T{OFF}APE OR {RVS}
D{OFF}ISK: {4}";
FP 730 GET AS:IF AS="T"THEN PR
INT"T{DOWN}":GOTO880
HQ 740 IF AS<>"D"THEN730
HH 750 PRINT"D{DOWN}":OPEN15,8
,15,"I0":B=EA-SA:INS="
0":+INS:IF OP THEN810
SQ 760 OPEN 1,8,8,INS+"P,W":G
OSUB860:IF A THEN220
FJ 770 AH=INT(SA/256):AL=SA-(A
H*256):PRINT#1,CHRS(AL)
;CHRS(AH);
PE 780 FOR I=0 TO B:PRINT#1,CH
RS(PEEK(BS+I));:IF ST T
HEN800
FC 790 NEXT:CLOSE1:CLOSE15:GOT
O940
GS 800 GOSUB1060:PRINT"{DOWN}
{BLK}ERROR DURING SAVE:
{4}":GOSUB860:GOTO220
MA 810 OPEN 1,8,8,INS+"P,R":G
OSUB860:IF A THEN220
GE 820 GET#1,AS,BS:AD=ASC(AS+Z
S)+256*ASC(BS+ZS):IF AD
<>SA THEN F=1:GOTO850
RX 830 FOR I=0 TO B:GET#1,AS:P
OKE BS+I,ASC(AS+ZS):IF(
I<>B)AND ST THEN F=2:AD
=I:I=B
FA 840 NEXT:IF ST<>64 THEN F=3
FQ 850 CLOSE1:CLOSE15:ON ABS(F
>0)+1 GOTO960,970
SA 860 INPUT#15,A,AS:IF A THEN
CLOSE1:CLOSE15:GOSUB10
60:PRINT"{RVS}ERROR: "A
$
GQ 870 RETURN
EJ 880 POKE183,PEEK(FA+2):POKE
187,PEEK(FA+3):POKE188,
PEEK(FA+4):IFOP=0THEN92
0
HJ 890 SYS 63466:IF(PEEK(783)A
ND1)THEN GOSUB1060:PRIN
T"{DOWN}{RVS} FILE NOT
{SPACE}FOUND ":GOTO690
CS 900 AD=PEEK(829)+256*PEEK(8
30):IF AD<>SA THEN F=1:
GOTO970
SC 910 A=PEEK(831)+256*PEEK(83
2)-1:F=F-2*(A<EA)-3*(A
>EA):AD=A-AD:GOTO930
KM 920 A=SA:B=EA+1:GOSUB1010:P
OKE780,3:SYS 63338
JF 930 A=BS:B=BS+(EA-SA)+1:GOS
UB1010:ON OP GOTO950:SY
S 63591
AE 940 GOSUB1080:PRINT"{BLU}**
SAVE COMPLETED **":GOT
O220
XP 950 POKE147,0:SYS 63562:IF
{SPACE}ST>0 THEN970
FR 960 GOSUB1080:PRINT"{BLU}**
LOAD COMPLETED **":GOT
O220
DP 970 GOSUB1060:PRINT"{BLK}
{RVS}ERROR DURING LOAD:
{DOWN}{4}":ON F GOSUB98
0,990,1000:GOTO220
PP 980 PRINT"INCORRECT STARTIN
G ADDRESS (":GOSUB360:
PRINT")":RETURN
GR 990 PRINT"LOAD ENDED AT ";:
AD=SA+AD:GOSUB360:PRINT
DS:RETURN
FD 1000 PRINT"TRUNCATED AT END
ING ADDRESS":RETURN
RX 1010 AH=INT(A/256):AL=A-(AH
*256):POKE193,AL:POKE1
94,AH
FF 1020 AH=INT(B/256):AL=B-(AH
*256):POKE174,AL:POKE1
75,AH:RETURN
FX 1030 IF AD<SA OR AD>EA THEN
1050
CR 1040 IF (AD>511 AND AD<6528
0) THEN GOSUB1080: F=0
: RETURN
HC 1050 GOSUB1060:PRINT"{RVS}
{SPACE}INVALID ADDRESS
{DOWN}{BLK}":F=1:RETU
RN
AR 1060 POKE SD+5,31:POKE SD+6
,208:POKE SD,240:POKE
{SPACE}SD+1,4:POKE SD+
4,33
DX 1070 FOR S=1 TO 100:NEXT:GO
TO1090
PF 1080 POKE SD+5,8:POKE SD+6
,240:POKE SD,0:POKE SD+
1,90:POKE SD+4,17
AC 1090 FOR S=1 TO 100:NEXT:PO
KE SD+4,0:POKE SD,0:PO
KE SD+1,0:RETURN

```